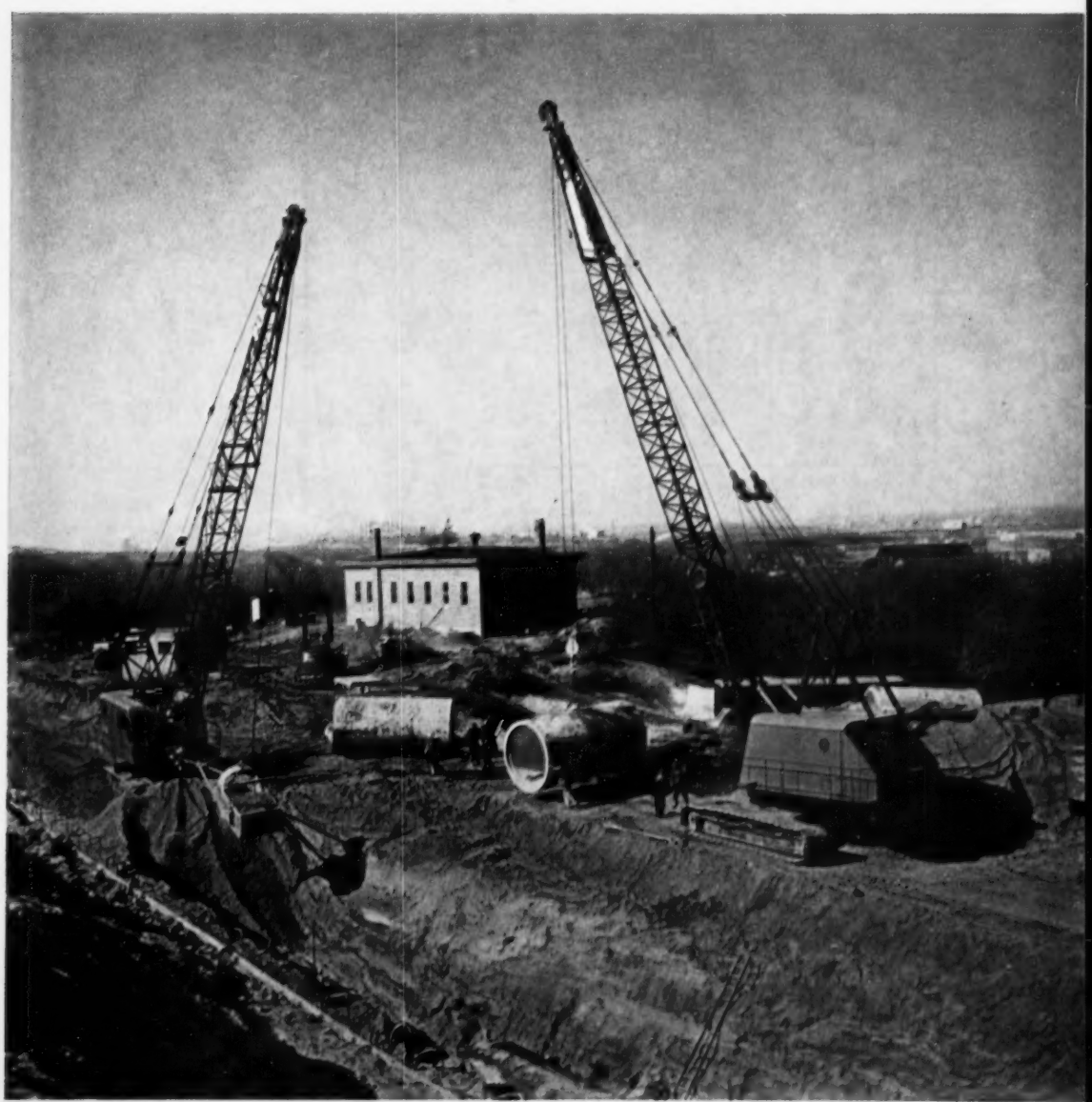
PRICE $1.00

Construction Methods AND EQUIPMENT

A McGRAW-HILL PUBLICATION

MAY, 1957



In New Jersey, crane swings 84-in. pipe to deep, wellpointed trench dug by dragline . . . p2

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RECORDS* PROVE

Twice the rope life

**Case histories show the proof. Yellow Strand Flattened Strand Wire Rope is making records of double the life, and even more, compared to round strand construction wire ropes. Ask your distributor, or write us for actual records on its performance.*

...with YELLOW STRAND Flattened Strand Wire Rope

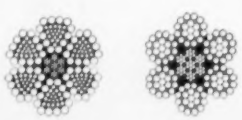
It has greater surface area! It has 10% greater strength! It's more crush resistant! It gives up to double, or more, the life of round strand rope! These are, briefly, the profitable advantages of Yellow Strand Flattened Strand on your dozers, scrapers, draglines, trench hoes and hoist lines.

And Yellow Strand Flattened Strand is "always on hand" at your nearby Broderick & Bascom distributor. You can depend on his specialized "know how" in recommending the right rope for your equipment. You can benefit by his prompt attention to your needs — backed by nationwide factory and warehouse stocks by B & B.

Specify Yellow Strand Flattened Strand on your next wire rope order and get the proof of lower overall costs and longer life. Ask your nearest B & B distributor, or write direct to us for more information on all your wire rope needs.

Here's Why Flattened Strand Lasts Longer

Compare Yellow Strand Flattened Strand with round strand wire rope (at right). In Flattened Strand you have twelve contact points, greater bearing area, smoother surface, less wear. Result: longer service, lower final cost.



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Announcing the all-nylon

B.F.Goodrich

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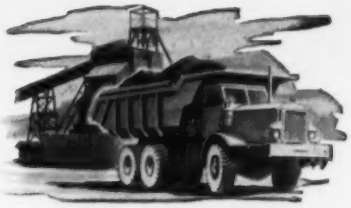
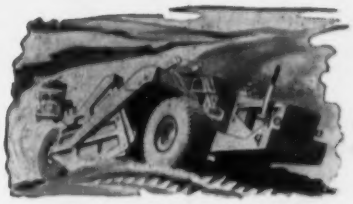


FOR MINES

QUARRIES



DIRT-MOVING JOBS

FLEX-RITE construction prevents unnecessary tire failures!

THE new B.F.Goodrich Rock Service tire—unlike an ordinary tire—is *built to its inflated shape*. When inflated, the tire body is not distorted. The whole tire flexes evenly, uniformly. No *localized* stresses that often cause unnecessary tire failures. FLEX-RITE construction eliminates this major cause of tire trouble and expense!

New B.F.Goodrich Rock Service tires are built with FLEX-RITE nylon cords. There are no cross threads to rub and chafe, creating tire-killing heat. FLEX-RITE nylon cords withstand double the impact of other materials, resist heat blowouts and flex breaks. Result: more retreadable Rock Service tires.

Greater traction! Puncture protection!

The double chevron tread gives maximum traction and skid resistance in forward or reverse. Rugged sidewalls defy rock bruises. V-shaped grooves expel stones. B.F.Goodrich Tubeless construction runs cooler, protects against punctures, cuts maintenance costs, is easier to service.

See the new, money-saving Rock Service nylon tire at your B.F.Goodrich dealer's today. It's the most advanced tire on the market today built for off-the-road hauling. *B.F.Goodrich Tire Co., A Division of The B.F.Goodrich Co., Akron 18, Ohio.*

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B.F.Goodrich tires when ordering new equipment

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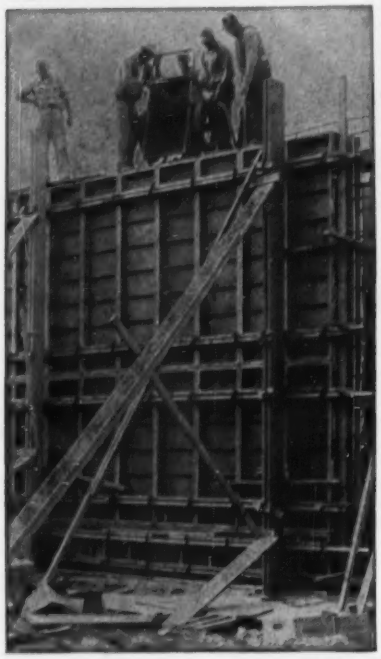
Your B.F.Goodrich dealer is listed under Tires in the Yellow Pages of your phone book

Symons FIELD REPORT...



Pouring Costs Cut 25% with Symons Forms . . .

Joseph R. Farrell, Inc., Philadelphia, general contractor, saved more than 25% in pouring costs on the new Cardinal Dougherty High School through the use of Symons Forms. 5,522 feet of Symons Forms were purchased for the job, and were used more than eight times. A total of 50,000 square feet of forming was erected for the 1600 yards of concrete.

Contributing to the speed and economy of the pouring was the use of 2" x 12" strong backs. The strong backs were held in place by 12" standwall ties used as strong back ties to make the horizontal joints stay plumb for the 18 and 20 foot walls. The strong backs permitted continuous pouring of the foundation walls.

With your plans, our engineers will prepare a complete form layout, bill of materials, and make recommendations for the most efficient and cost saving method of forming.

Symons Forms can be rented with purchase option. Symons Clamp & Mfg. Co., 4255 Diversey Avenue, Dept. E-7, Chicago 39, Illinois.

Workmen strip forms while a new pour is started.

Catalogs and Added Information on FORMS—CLAMPS—SHORES Sent on Request

Construction Methods AND EQUIPMENT

MAY, 1957

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On the Cover

Big outfall at South Amboy, N.J., goes in fast as Manitowoc crane swings 84-in. section of concrete pipe into deep trench excavated by P&H dragline. Line of Griffin wellpoints keeps trench dry.

Prestressed Concrete

Reprints of the CM&E special report on techniques and equipment for prestressing concrete now are available. Single copies, 35¢; 10 copies or more, 25¢ each. Address orders to: The Editor, CM&E, 330 W. 42nd St., New York 36, N.Y.

MEMBER

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2116

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NEXT MONTH

A combination of careful driving and airlift removal of material makes it possible for Pacific Bridge Co. to place 60 steel pipe caissons as much as 135 ft deep without unwatering at San Francisco Naval Shipyard.

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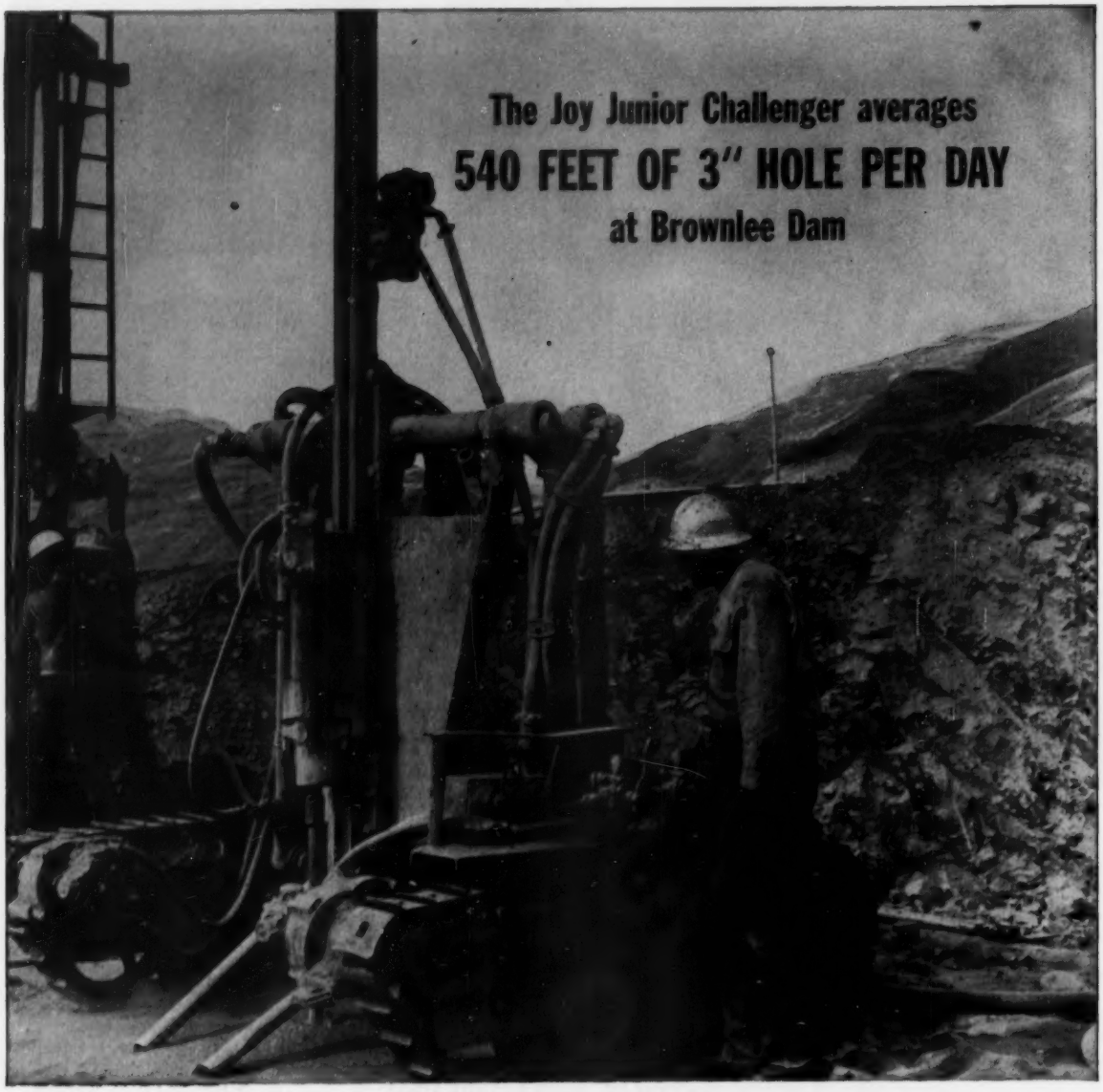
Gorman-Rupp Pumps keep this hot job moving!

The Horvitz Company, under a $2½ million contract, is building a ten-span bridge over the historic Ohio Canal and Cuyahoga River near Cleveland. The job, which includes two other bridges and river relocation, opens up a direct connection between heavily traveled Routes 8 and 21.

Constant seepage from the canal is always a threat for Mike Sekela, supervisor for Horvitz. Here he has spotted a Gorman-Rupp 40M Pump, Model 34A-VG4D, to dewater the cofferdam 20 ft. down for pilings. Mike says, "We prefer Gorman-Rupp because of their proven dependability."

THE GORMAN-RUPP COMPANY

305 Bowman Street • Mansfield, Ohio



At a large project like Brownlee dam, a drill has to be versatile . . . move quickly, drill at any angle, have the power and rotation to punch holes through all kinds of formations.

In a 20 hour day, working six days a week, this Joy Junior Challenger has hammered out the average of 540 feet of 3 inch hole per day. This footage includes horizontal holes, vertical holes, and angled holes up to 4 inches in diameter. The drill has moved all over the job, and taken over in locations where other drills were having difficulty with penetration.

If you've got a difficult job coming up, better take a look at the drill that's really versatile, the Joy Junior Challenger. ***Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.*** In Canada: Joy Manufacturing Company (Canada) Limited, Galt, Ontario.

Write for FREE Bulletin 175-23

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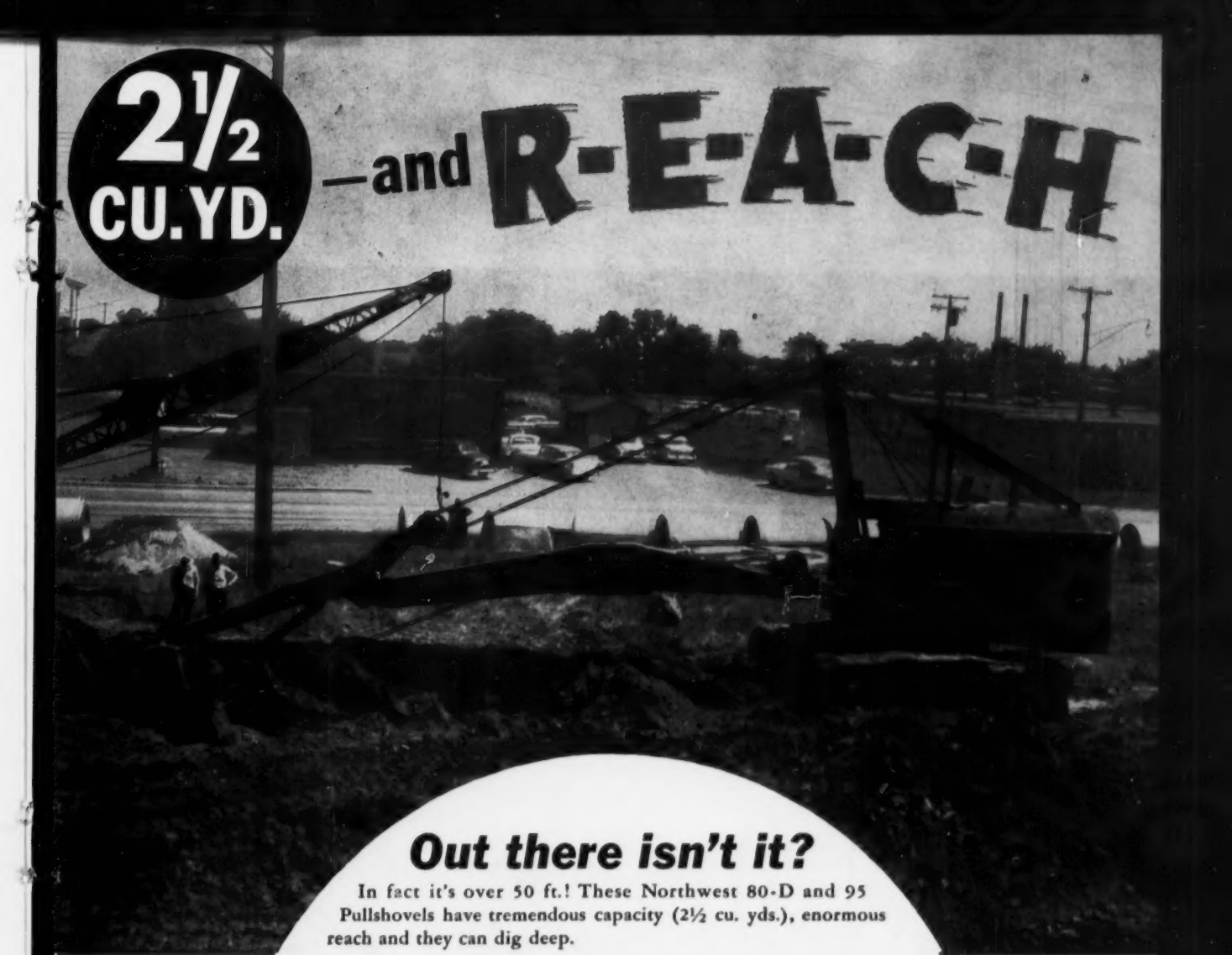

Out there isn't it?

In fact it's over 50 ft.! These Northwest 80-D and 95 Pullshovels have tremendous capacity (2½ cu. yds.), enormous reach and they can dig deep.

When you are up against jobs that are Big, Deep, Wet and Troublesome there is one thing that counts more than anything else. That is a machine's ability to stay on the job! To make money you have to have equipment with the qualities that will assure you steady hour in, hour out, operation.

Northwest Pullshovels have proved their ability. Northwest Crawlers stand up in miles of travel. Rugged cast steel machinery bases with cast steel machinery side frames take the loads of digging and maintain shaft alignment and reduce wear. The "Feather-Touch" Clutch Control reduces the fatigue of operation—gives greater output without resorting to complicated and delicate valves, tubing, pumps and compressors. Uniform Pressure Swing Clutches take the jerks and grabs out of swinging, make spotting the load easier and reduce spillage at the truck.

These are just a few of the advantages you should have. Advantages that make money. Ask a Northwest Man to bring you up to date on the latest Northwest features.

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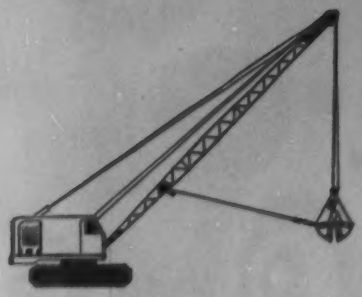

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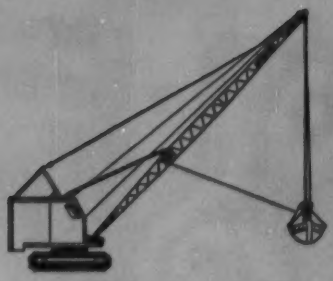

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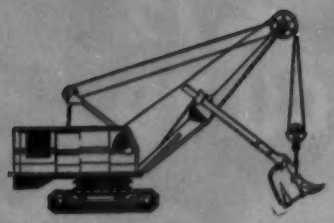

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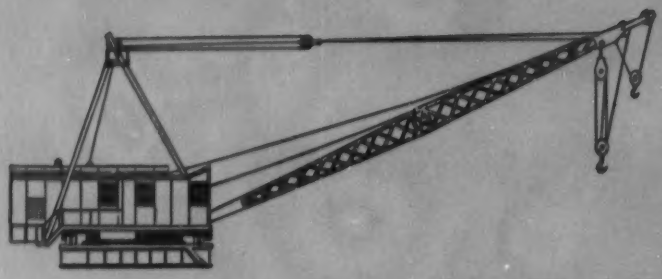

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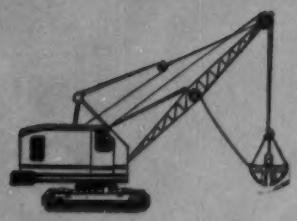

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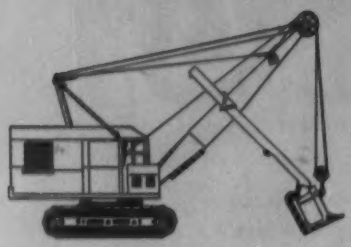

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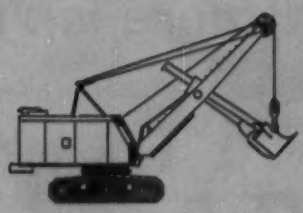

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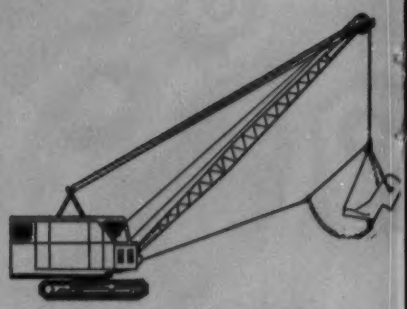

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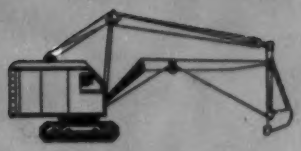

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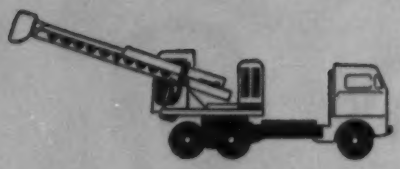

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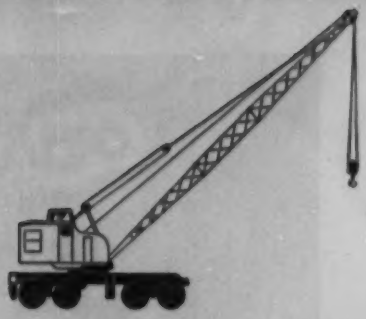

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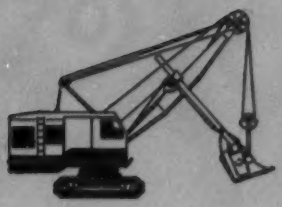

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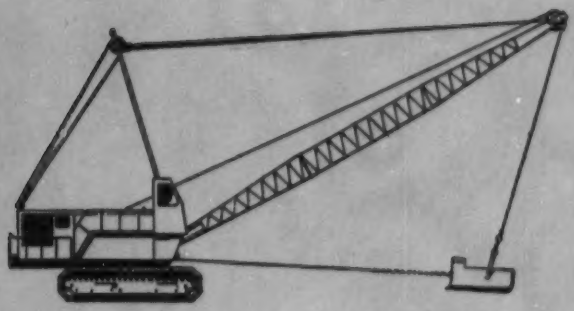

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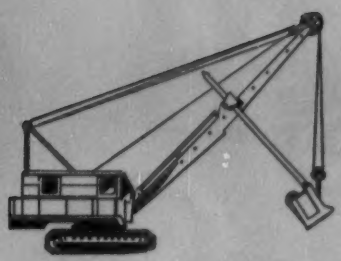

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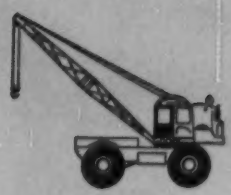

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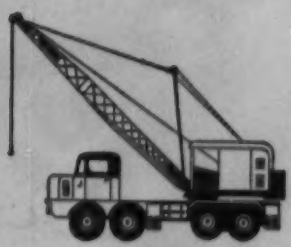

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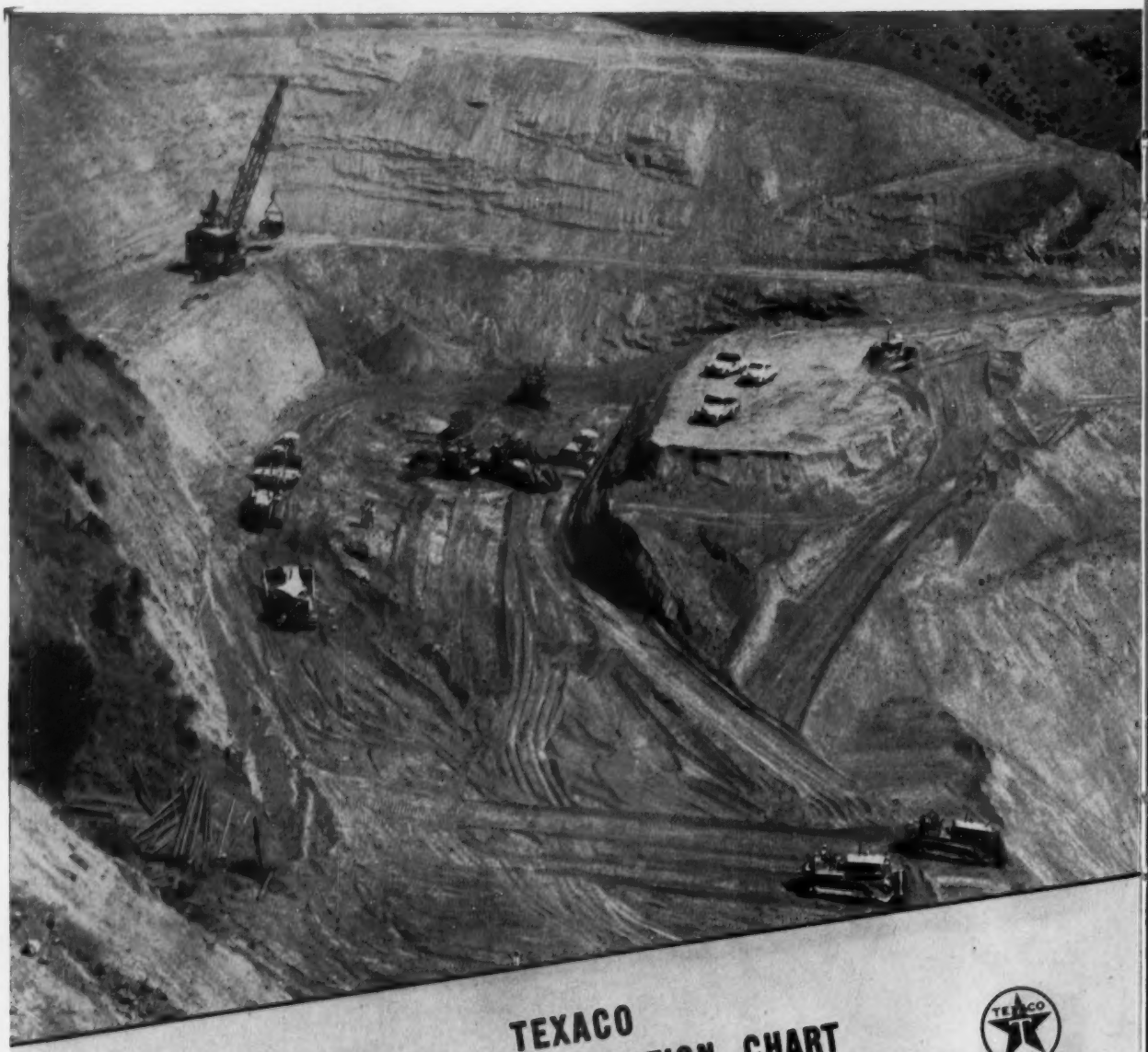

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All your major lubrication can be done with just 6 lubricants — and no more — when you follow a Texaco Simplified Lubrication Plan. Tailored by Texaco to fit any job you do, every Texaco Simplified Lubrication Plan takes all the guesswork out of lubrication. It makes it possible to avoid lubrication errors that all too often send equipment to the repair shop. And because fewer lubricants are necessary, lubricant inventory is reduced and greater simplicity — and economy — are assured.

Your chart will certainly specify a *Texaco Ursa Oil* to keep your diesels and heavy duty gasoline engines on the toughest jobs — without breakdowns. The *Texaco Ursa Oils* recommended for contractors' equipment are both detergent and dispersive—rings stay free, valves seat properly and you get full compression and complete combustion. You get, in effect, what you need most from your equipment — dependable performance to meet tight schedules.

ASK A TEXACO LUBRICATION ENGINEER

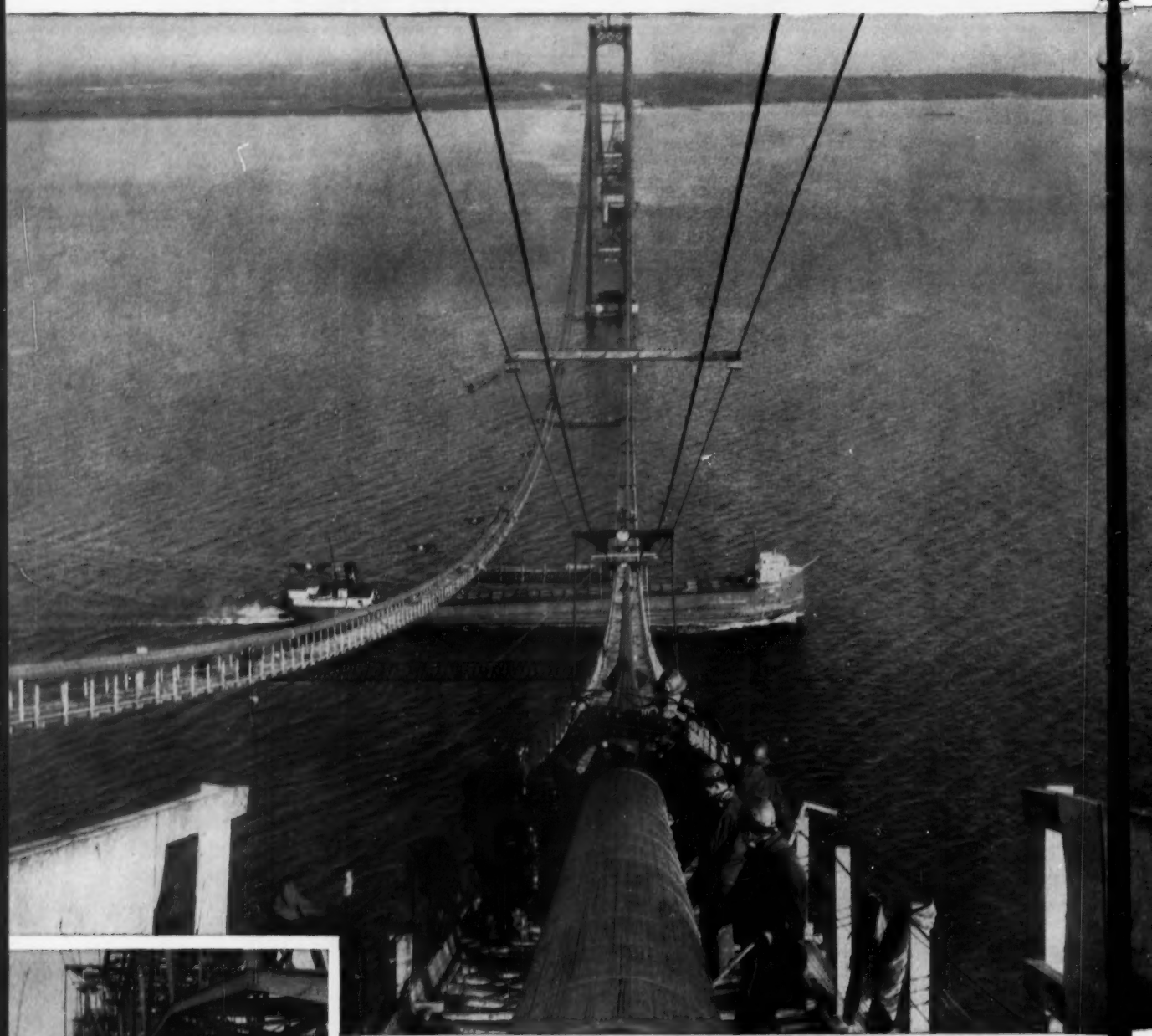
to simplify your lubrication and reduce costs with a Texaco Simplified Lubrication Plan. Just call any of the more than 2,000 Texaco Distributing Plants in the 48 States or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

The Mighty Mackinac...World's



Main cables being compacted by jacks and bound with steel bands. Catwalks are supported on five 2¼" Tiger Brand Wire Ropes which will be pre-stressed and used later for vertical suspenders.

Clamping main cable. Workman prepares to clamp a bundle of 340 wires into a strand. Thirty-seven strands will make up the completed cable, two feet in diameter.

Quick facts about the Mackinac Bridge

Owner: State of Michigan, Mackinac Bridge Authority, Prentiss M. Brown, Chairman

Designer: Dr. David B. Steinman

Substructure Contractor: Merritt-Chapman & Scott Corporation

Superstructure Contractor: American Bridge Division, United States Steel

Wire Rope Manufacturer:
American Steel & Wire Division, United States Steel

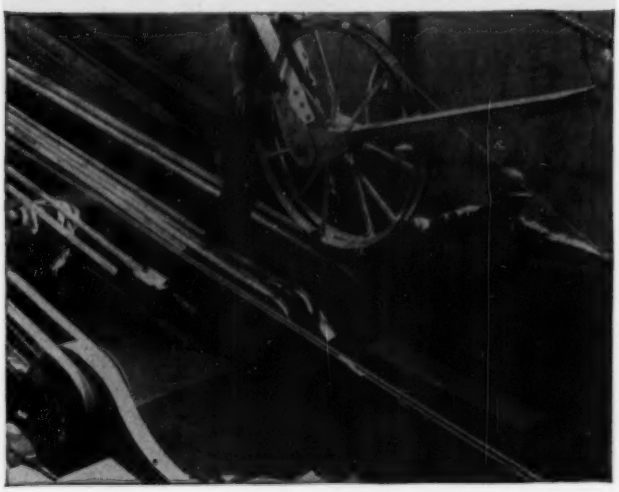
Total length: 26,444 feet • Suspension Bridge length: 8,614 ft. • Main Span length: 3,800 feet • Tower height above water: 552 feet • Total length cable wire: 41,000 miles • Total length wire rope suspenders: 125,000 feet. Wind resistance: 120 miles per hour • Approximate cost: 100 million dollars.

s longest suspension bridge

...8,614 ft.

Solid anchorage for the main cables, high as a 10-story building and covering an area equal to about one-third of a football field.

Key step in cable spinning operation. Workmen putting cable wire loop on the spinning wheel and adjusting wire on the anchors. Each cable is spun by two wheels shuttling back and forth; each wheel pulls two loops or four wires per trip from one anchorage to the other.



The new Mackinac suspension bridge spanning the straits between Mackinaw City and St. Ignace, Michigan is 8,614 feet long including anchorages. This makes it the world's longest single suspension bridge. The over-all length of the bridge with approaches is 26,444 feet. (The San Francisco-Oakland Bay bridge has a total length of 8¼ miles, but is in reality two bridges with an island between.)

When completed as a four-lane artery, the Mackinac bridge will link Michigan's upper and lower peninsulas. Cars can cross in 10 to 12 minutes—6,000 of them per hour. Contrast this with 45 to 55 minutes on car ferries with a total capacity of 416 cars an hour.

The two main towers are as high as 46-story buildings—552 feet above water level. Over these, two huge suspension cables have been "spun" from 41,000 miles of American Tiger Brand Galvanized Bridge Wire. These cables are two feet in diameter and will support the bridge floor through vertical suspenders of 2¼-inch-diameter Tiger Brand Galvanized Bridge Rope. A total of 125,000 feet of suspender ropes will be used in the completed bridge. These will be pre-stressed to remove structural stretch.

The ability of American Steel and Wire to engineer and produce the Bridge Wire and Wire Rope for jobs of this magnitude is proof of the superior quality you can expect from any type of Tiger Brand Wire Rope you need. Write for our latest book.

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed

UNITED STATES STEEL

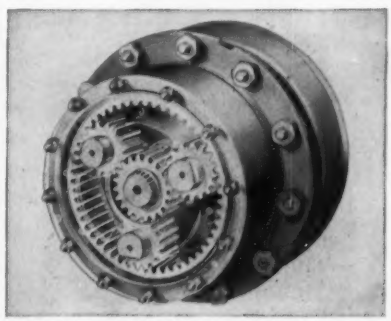
Announcing

AUTOCAR

A rugged off-highway dump truck with planetary-gear rear axle . . . capable of handling 15-ton payloads at speeds up to 39 mph

the NEW

AP-15



THE HEART OF IT is the planetary-gear rear axle. A "sun" gear at each end of the rear axle shaft meshes with three pinion or "planet" gears which in turn help drive the rear wheels.

AUTOCAR TRUCKS

Autocar Division of the White Motor Company
Exton, Pa.

Autocar

WHAT ARE THE ADVANTAGES OF THE AUTOCAR PLANETARY AXLE?

1. First and foremost, it provides long gear and shaft life for a giant truck.

2. It decreases torque load on axles and differential.

3. Owing to multiple gear-tooth contacts, it provides high torque capacity.

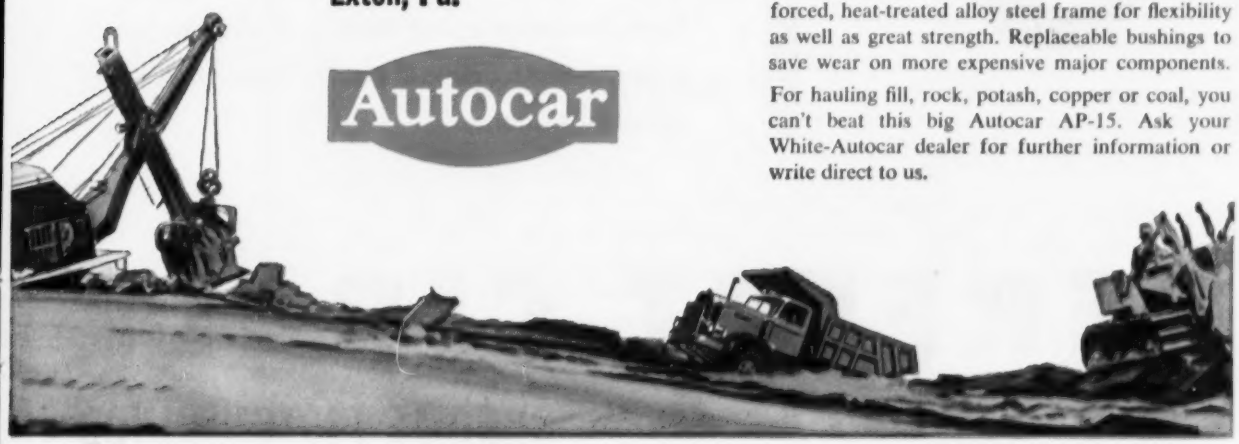
GOOD GROUND CLEARANCE, TOO. By dividing the axle ratio between the gear carrier mounted at the center of the rear axle and the planetary reductions at the outer ends we reduce the main drive gears in diameter and gain substantially greater ground clearance under the housing bowl.

15 TONS AT 39 MPH. The AP-15 hauls its big payload at 39 mph. It permits a fast trip cycle and thus hauls many more tons per working day.

AUTOCAR DRIVER CAB AND POWER STEERING make the AP-15 easy on the driver. The Driver Cab with its fully adjustable seat, form-fitting back, and accessible controls permits the driver to handle this hardworking truck all day long and like it.

AND, THIS AUTOCAR IS BUILT TO LAST
Nuts and bolts instead of rivets throughout. Reinforced, heat-treated alloy steel frame for flexibility as well as great strength. Replaceable bushings to save wear on more expensive major components.

For hauling fill, rock, potash, copper or coal, you can't beat this big Autocar AP-15. Ask your White-Autocar dealer for further information or write direct to us.

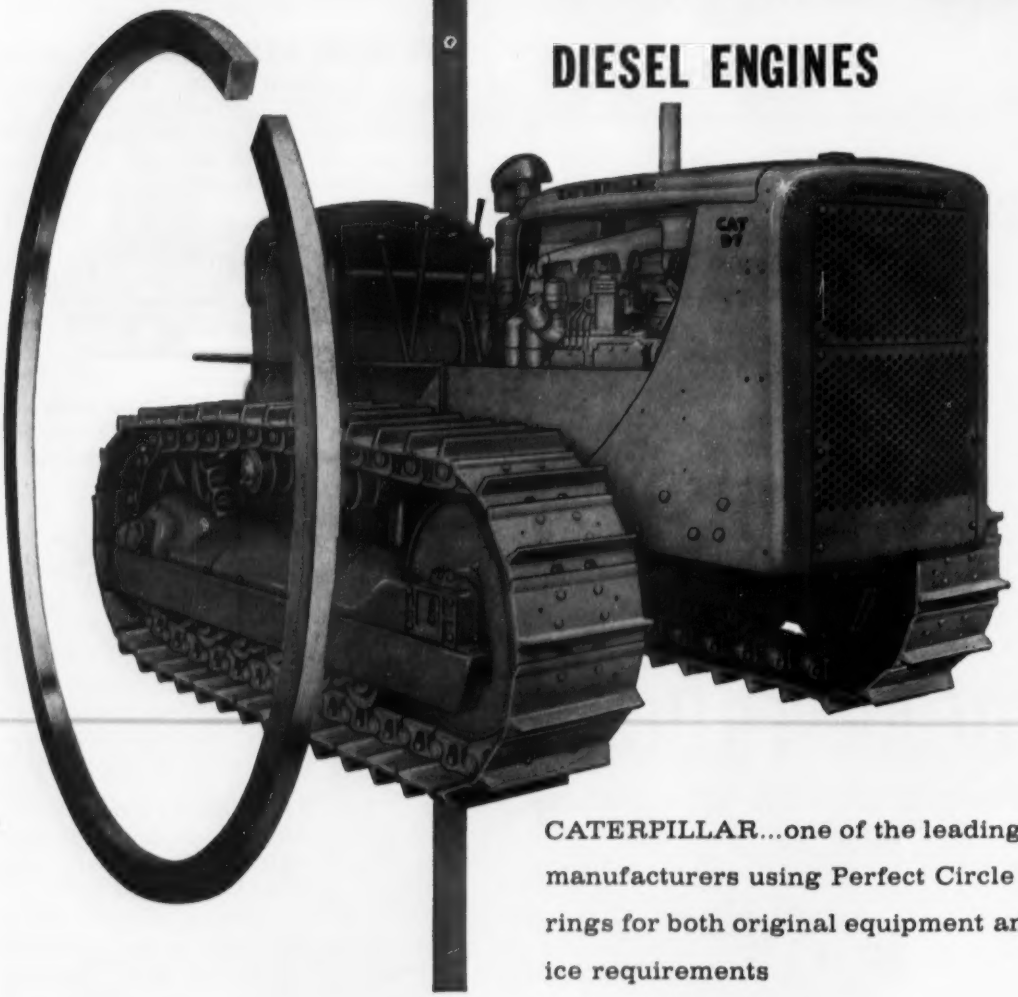


For

Top Performance in

CATERPILLAR

DIESEL ENGINES



CATERPILLAR...one of the leading engine manufacturers using Perfect Circle chrome rings for both original equipment and service requirements

PERFECT CIRCLE

CHROME PISTON RINGS

Construction News From Washington

Washington, D.C.
May, 1957

Tight Money Probe

The Administration's tight money policy is going to get a critcial study by the Democratic-controlled Senate Finance Committee. Chairman Harry F. Byrd, D., Va., has announced that the committee will begin the inquiry soon.

Shortage of housing credit will get attention as well as the failure of the $700-million Lease-Purchase Program for federal buildings and the impact of high interest rates on school construction.

Sen. Robert S. Kerr, D., Okla., to date known primarily for oil and gas legislation, is the ramrod behind the Finance Committee program. Byrd, himself, will show up as a critic of high interest rates; and look to young southerners Russell Long and Albert Gore to be active in the study.

Small Business Aid

The White House is backing legislation to make the Small Business Administration a permanent government agency. A law is necessary because the agency's two-year charter expires this year; it's sure to be passed.

Actually, the agency hasn't lent a dime since Feb. 1 when it ran out of money. Congress will re-fill the loan fund, but up to now it's been busy with other things. Antitrust chief Hansen spoke for the Administration when he said that Eisenhower wants SBA to act as advisor to the White House and represent small business in dealing with other government agencies, as well as lend money.

Seaway Cost Soars

Construction of the St. Lawrence Seaway is going to cost at least $165 million more than original estimates.

Since 1953, the estimated cost of completing the job on the U.S. side of the river has doubled, up from $67 million to $133 million. The corresponding rise for Canada's larger portion of the project has been 45%, up from $196 million to $285 million.

Only part of the increase has been due to rising construction prices. Most of it has resulted from additions and changes in project plans. That was made clear to the House Public Works Committee by Administrator Lewis G. Castle of the St. Lawrence Seaway Development Corp.

continued on next page

Price rises since December, 1952, account for $19 million of the increase in the construction cost estimate. Added construction items account for $37 million, and design changes for $10 million.

Final cost, however, may exceed these figures. The largest and most expensive of the added items—dredging of the South Cornwall Channel—has twice failed to bring in an acceptable bid. This job alone may boost estimated costs by many millions.

Highway Spending Stretched

The huge highway trust fund is building up about according to schedule. But Administrator Bertram D. Tallamy tells Congress that actual construction will run 2 or 3 years longer than Congress had planned when it passed the legislation. That means that highway business from the interstate program's $27.5 billion will stretch out into 1970 and 1971—rather than end in 1969, as earlier schedules had it. The slowdown will begin in 1960 when only $1.6 billion will be available, instead of the $2.2 billion authorized by law.

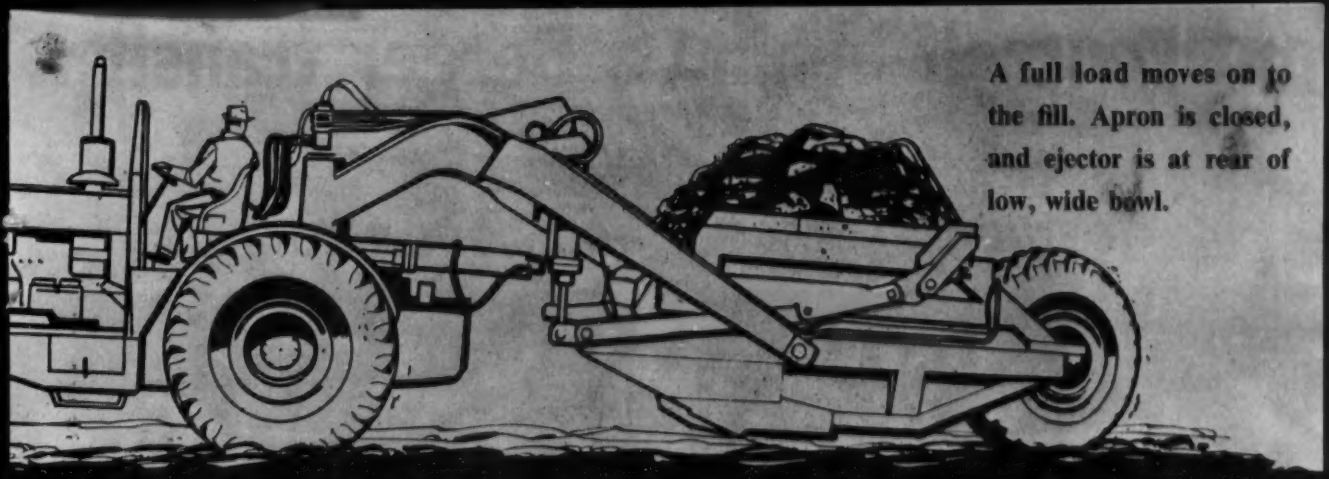
Cutting the Budget

Don't be misled by the stories out of Washington on the billions being cut by Congress out of Eisenhower's spending plans for the year beginning next July 1. Federal construction spending isn't going to be affected much. Reason: much of this spending—on such things as housing, highways, airports, defense bases, public health facilities, rivers and harbors, dams and power plants—is on projects already under way or for programs to which Congress is committed by law. On these, there's no way Congress can save, other than by cutting off the program or project—which is politically almost impossible.

But the big $1.5-billion Public Works Bill may be in for another fight. The economy drive in Congress makes the legislation—which approves projects but doesn't vote any money—fair game for paring or delay. President Eisenhower vetoed a similar measure last year, complaining that too many projects of doubtful feasibility were included. The measure won't come up for consideration for a month or so; and it easily could be deferred until next year. With election day closer, chances for approval will improve by then.

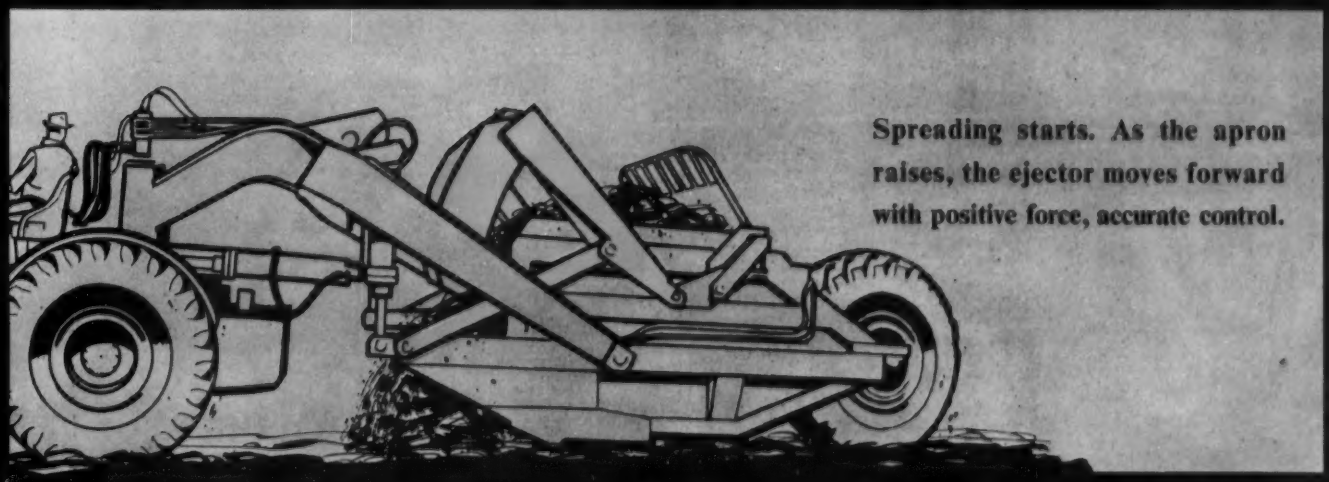
New Referee

Successor to John Dunlop has been picked to head up the National Joint Board for the Settlement of Jurisdictional Disputes. The man to take over when Dunlop leaves in August is Oscar S. Smith, who is now Director of Personnel for the Atomic Energy Commission. Official announcement may not be made for some time, but Smith already is being broken in on the duties of the job.



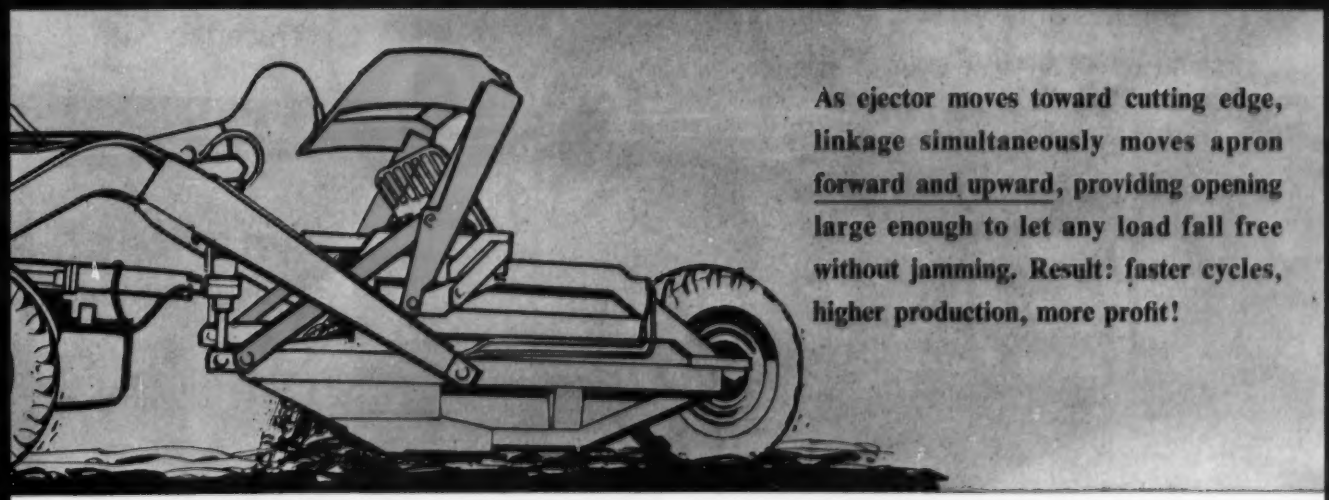
A full load moves on to the fill. Apron is closed, and ejector is at rear of low, wide bowl.

How Allis-Chalmers' patented 3-point scraper linkage



Spreading starts. As the apron raises, the ejector moves forward with positive force, accurate control.

assures fast, clean, controlled spreading of any material



As ejector moves toward cutting edge, linkage simultaneously moves apron forward and upward, providing opening large enough to let any load fall free without jamming. Result: faster cycles, higher production, more profit!

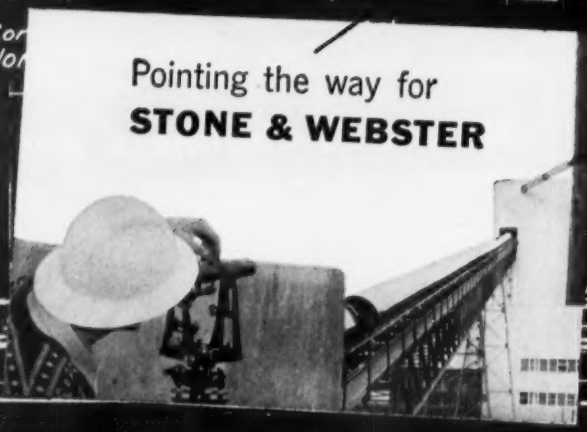
Only your nearby Allis-Chalmers dealer can offer you this important advantage. See it demonstrated now . . . on either motor or pull-type scrapers. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS *Engineering in Action*

put yourself behind a Berger transit...

...and see why so many leading engineers and contractors do

Teaming up with
F. H. McGRAW & CO.
on billion-dollar
atomic energy project



Pointing the way for
STONE & WEBSTER

LOVELL-BELCHER
marks out
New York skyline

GILBANE
lays out new
atomic vistas
for Tracerlab

TURNER sights on
new lines of sound

BARLETTA
narrows problems
on world's widest
vehicular tunnel

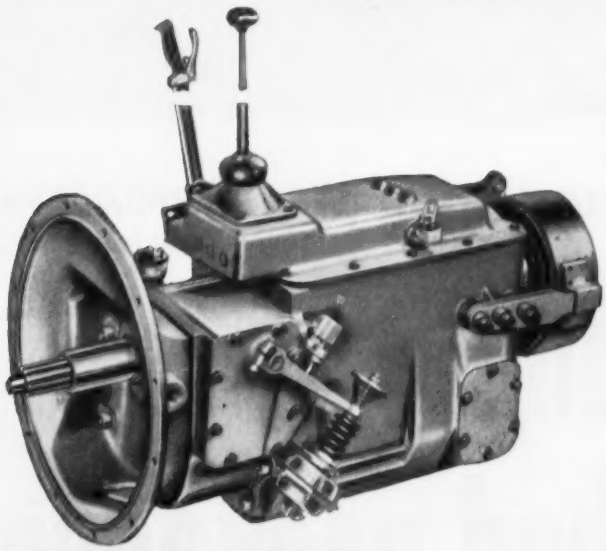
THE BEST IN SIGHT IS **BERGER**

ENGINEERING AND SURVEYING INSTRUMENTS... SINCE 1871

C. L. Berger & Sons, Inc., 53 Williams St., Boston 19, Mass.

Write for copy of "Accuracy In Action"...

Ideal for Highway Hauling-
CLARK stepMatic Transmission



Here's happy and profitable news for all operators whose truck equipment takes punishment—Clark's stepMatic Transmission. This transmission has proved particularly ideal for long-haul, high-speed operations.

- Ten speeds—splitting ratios in between the normal 5-speed transmission ratios—giving 28% steps to fit every hauling need.

Transmission gears synchronized. Semi-automatic shift for the splitting ratios

- Full control of gear-shifting at all times.
- Spares engine—the right ratio for every grade prevents engine lugging—decreases hauling time and fuel consumption.
- Increases transmission life—reduces shock loads. Less downtime for repairs.

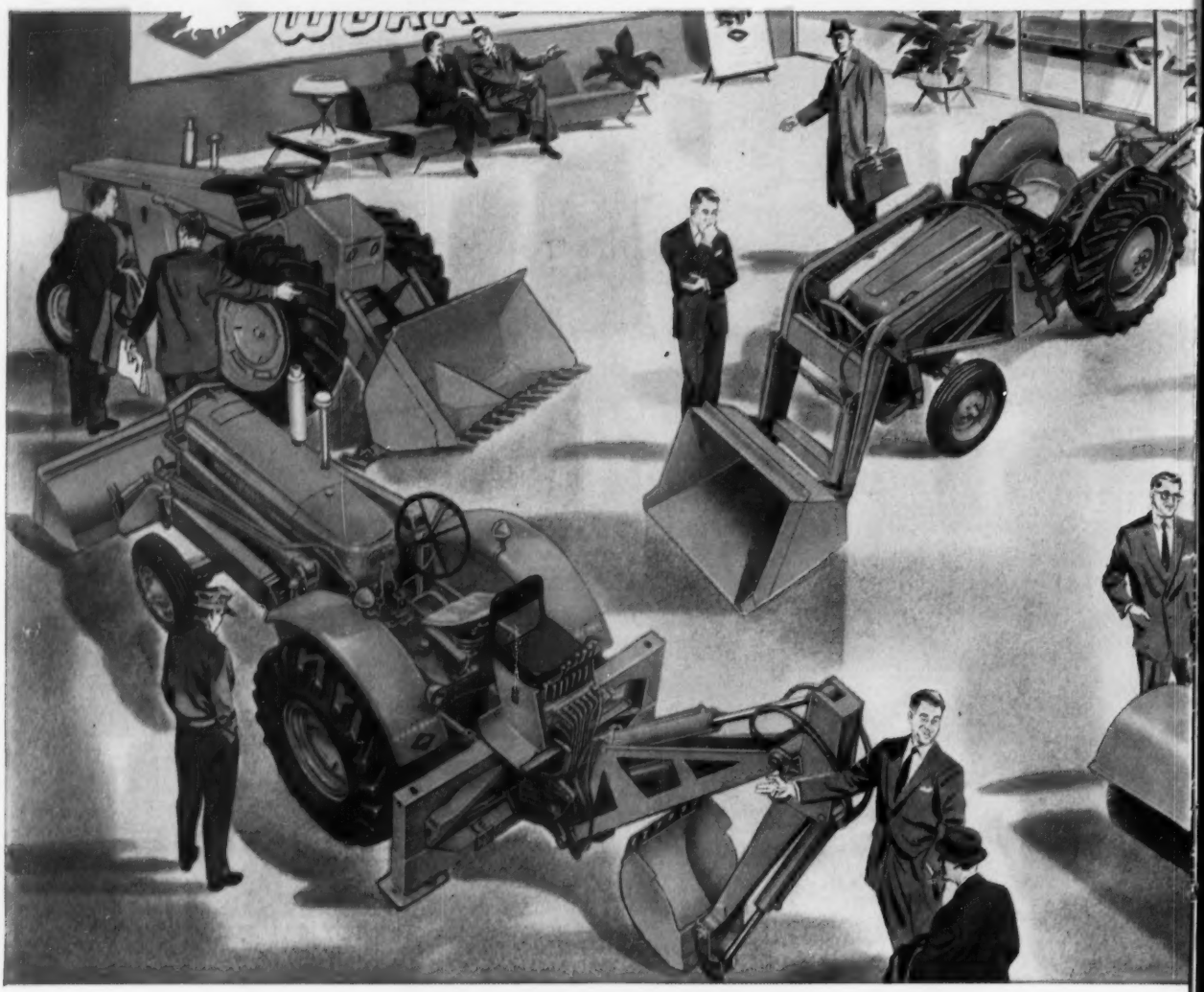
By all means write for full information on this highway-proved achievement of Clark engineering.

CLARK® EQUIPMENT

TRANSMISSION DIVISION

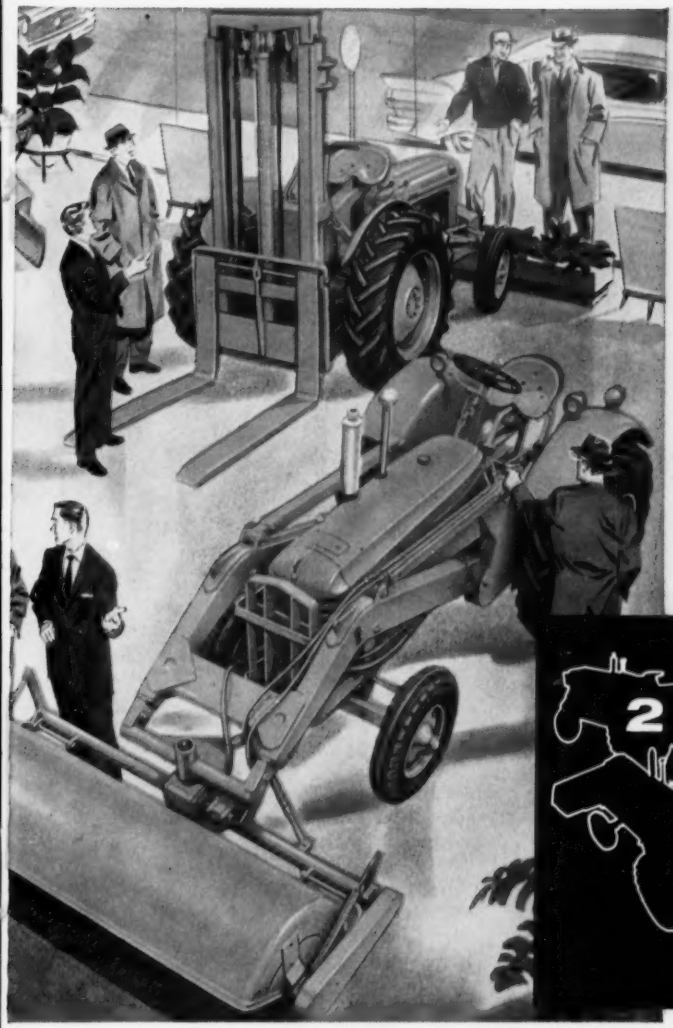
CLARK EQUIPMENT COMPANY

Falahee Road • Jackson 6, Michigan



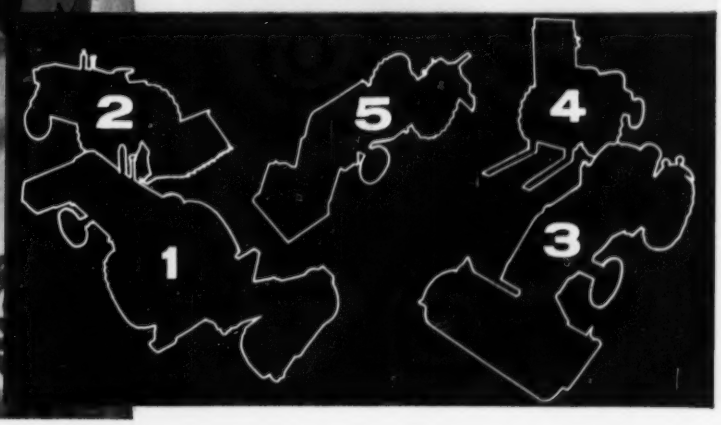
5 tractors, 20 interchangeable attachments--

new family of power-matched packages



Tractors and attachments — designed for each other

1. **52-hp** Work Bull Model 404 tractor. ¾-yd. Model 500 loader. Model 185 backhoe.
2. **42-hp** Davis Pit Bull. Model 500 loader with ⅞-yd. bucket. Scarifier.
3. **42-hp** Work Bull Model 303 tractor. Hydraulically-controlled, 8-ft. broom.
4. **Model 202 Fork Lift** with 10-ft. mast (Std.) for lifts of up to 4000 lbs. 21-ft. mast for lighter loads.
5. **34-hp** Work Bull Model 202 with rear-mounted multi-purpose, adjustable angle blade and . . . Model 102 loader with 11 cu. ft. hydraulic bucket and down-pressure cylinders.



WORK BULLS PAY OFF as high-performance, money-saving units on scores of jobs

THE reason — integrated design! Both tractors and attachments are designed for *multiple machine versatility*. For example — a Work Bull with a loader also mounts more than a dozen other interchangeable attachments that quickly, easily convert the same tractor into a highly efficient backhoe, fork lift, swinging crane, grader or any of many other highly efficient tools. And at a surprisingly low cost!

In five to 15 minutes you can mount or dismount any Work Bull attachment. Switching involves merely one man — no wrenches, no special gear. And front-end attachments utilize the same hydraulic arms and frame. Backhoe attaches or detaches in less than 5 minutes!

Check the list of Work Bull attachments. Choose the loader, blade, fork lift, mower, backhoe, snow plow, auger, broom, pipe and cable layer and others to meet your specific needs.

Get full details and the name of your nearest distributor. Write for 24-page catalog.

And you have a single source, one responsibility for sales and service on both tractors and attachments!

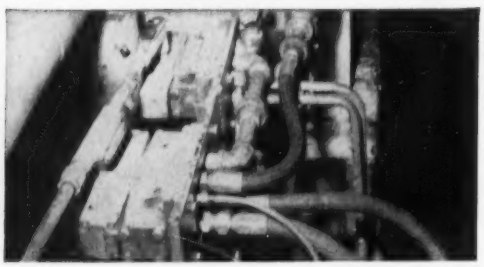
M·H·F WORK BULLS

Division of Massey-Harris-Ferguson, Inc.

20-E Quality Avenue **Racine, Wisconsin**

Aeroquip Hose Lines give long service on McCleery & Weston equipment.

Aeroquip Bulk Hose and Reusable Fittings Simplify Hose Line Replacement



Hydraulic feeder lines on cement mixer are Aeroquip 1503 Single Wire Braid Hose.

Aeroquip 1525 Hose on air control lines withstands constant flexing and vibration.

On-The-Job Assembly of Hydraulic and Air Lines Cuts Equipment Downtime

At the McCleery & Weston Hudson Street plant in Vancouver, B.C., this automatic mixer supplies concrete for a fleet of 15 ready-mix trucks.

To minimize downtime, Aeroquip Hose Lines are used on the mixer's hydraulic and air lines. When replacement hose lines are needed, they can be made up quickly and easily by cutting bulk hose to length and attaching the reusable fittings.

Learn how a surprisingly small inventory of Aeroquip Bulk Hose and Detachable, Reusable Fittings can simplify your hose line replacement problems. Call your Aeroquip Distributor listed in the Yellow Pages Telephone Book, or write us for information.

Aeroquip

REG. TRADEMARK

AEROQUIP CORPORATION, JACKSON, MICHIGAN

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HOW TO HANDLE WET JOBS

#38 of a Series

Project: Power Plant, Managua, Nicaragua
General Contractor: The H. K. Ferguson Company
Pumping Contractor: WELLPOINT DEWATERING CORP., NEW YORK

Wellpoints travel to remote Nicaragua to . . .

Control 32 ft of Water in Volcanic Soil

This was a job located, inaccessibly, in remote Nicaragua. Much of the equipment had to come via long overseas journey to the coast—then be hauled by narrow-gauge railroad to the work-site.

• **Wrestling with these** knotty problems of supply, H. K. Ferguson Co. required dependable performance in all respects. Efficient dewatering helped, as follows:

First, the wellpoint system (by Griffin) successfully dried the stubborn volcanic soil. 40,000 cu yds were then removed and much of this material was used to build the dike shown in photo (no sheeting needed here, excavation open cut).

• **Dike protected** work-area from the waves of wind-swept Lake Managua as construction went ahead on schedule. Griffin wellpoints travel everywhere, save trouble every time.

GRIFFIN WELLPOINT CORP.

DEWATERING • SOIL STABILIZATION • JETTING

MAIN OFFICE: 881 East 141st Street, New York 54, N. Y.

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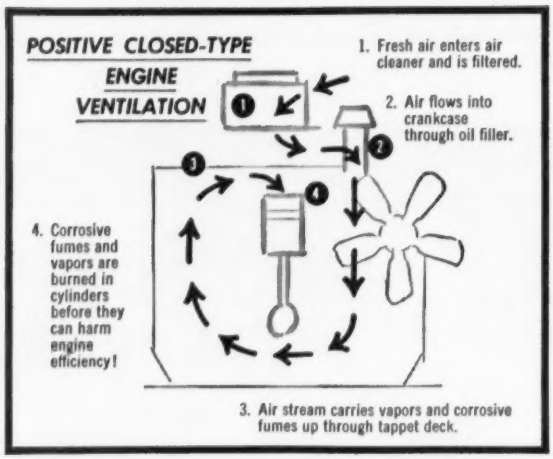
"CLEAN LIVING" GIVES A CHEVY ENGINE LONGER LIFE!

...more evidence that Chevrolet Task-Force trucks are engineered better and built better for bigger savings!


POSITIVE CLOSED-TYPE ENGINE VENTILATION
1. Fresh air enters air cleaner and is filtered.
2. Air flows into crankcase through oil filler.
3. Air stream carries vapors and corrosive fumes up through tappet deck.
4. Corrosive fumes and vapors are burned in cylinders before they can harm engine efficiency!

This drawing shows, roughly, one of the ways in which Chevrolet truck engines minimize a major cause of wear—dirt! Now consider this additional evidence that Chevy heavy-duty V8's and 6's "live clean" and bring you fleet, dependable power that costs less to use!

Extra filters give extra-clean fuel—Only *clean* fuel reaches the engine—that's one reason you can depend on a Chevrolet truck! All fuel is filtered twice (once in the fuel tank and again in the carburetor) to keep dirt and water from hampering efficient operation. Chevrolet truck V8's *provide* a *third* filter, at the carburetor, for triple protection!

Oil stays clean longer, too—Chevrolet truck V8's and 261-cu.-in. 6's come equipped with modern high-capacity oil filters (V8 filters are of the Full-Flow type). These engines keep *clean* oil flowing to moving parts; parts wear less and last longer because of it!

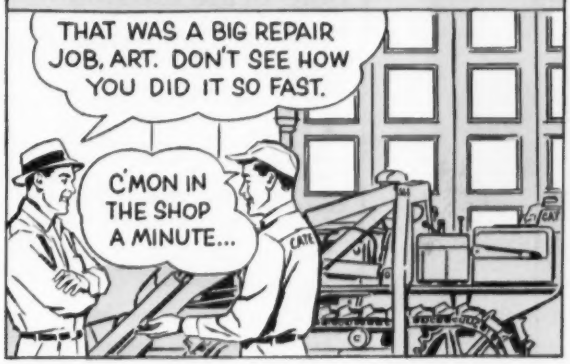
Even the air is cleaner—Dust and foreign matter in the air an engine "breathes" can reduce engine life by years. Chevrolet minimizes this wear-producing factor by providing big oil-bath air cleaners as *standard equipment* on all truck engines.

These are sound under-the-hood reasons why a Chevrolet truck will *stay* on your job and *save* on your job. There are others, too, including short-stroke V8 design (shortest stroke of any truck V8's!) and 6-cylinder engine design that puts out more power than any other in the field. You'll learn about them all when you visit your Chevrolet dealer. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

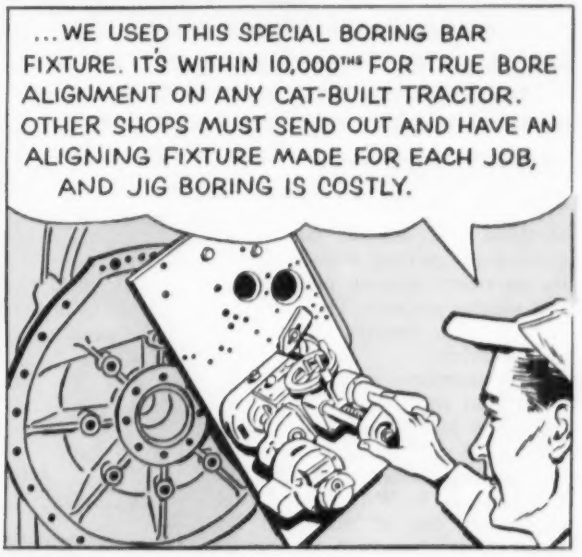
Biggest sellers . . . because they're biggest savers!

CHEVROLET TASK·FORCE 57 TRUCKS

THE CASE OF THE
TOOL THAT BUILDS EXTRA WORKING HOURS



WE'RE SET UP WITH DIFFERENT WORK AREAS, AND WITH SPECIAL TOOLS AND EQUIPMENT FOR DIFFERENT JOBS.
IT'S A NEAT LAYOUT, ALL RIGHT!


...WE USED THIS SPECIAL BORING BAR FIXTURE. IT'S WITHIN 10,000THS FOR TRUE BORE ALIGNMENT ON ANY CAT-BUILT TRACTOR. OTHER SHOPS MUST SEND OUT AND HAVE AN ALIGNING FIXTURE MADE FOR EACH JOB, AND JIG BORING IS COSTLY.

CATERPILLAR*
*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.
CAT CARE FOR LONGER WEAR
LET ME HELP KEEP YOUR CAT* EQUIPMENT ON THE JOB!
Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

Job Talk...

SMOOTH CURB is laid quickly by Stephens-Canfield machine on State Route 4 east of Dayton, Ohio. Rig placed between 2,000 and 3,000 ft a day. Mix is shoveled into hopper.

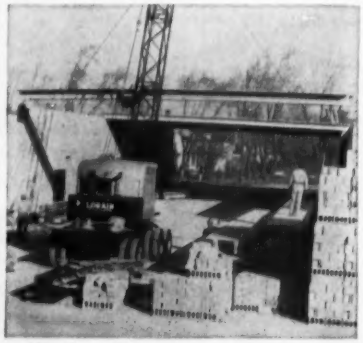
Self-Propelled Rigs Extrude Asphalt Curbs

Machine laid asphalt curbs and gutters are gaining wide popularity on street, airport, parking lot, and similar projects. They are fast and easy to construct and give good service.

Curb machines can place up to 2,000 ft in an 8-hr day. Bid prices for large jobs have been around $.70 per ft, and on small parking-lot jobs the prices vary from $1.00 to $1.50 per ft. With the average mold, one ton of mix will lay about 75 ft of curb. A number of shapes are available, ranging up to 10 in. wide and 12 in. high.

The method of placing is simple. Guide lines are laid on the existing pavement by string or chalk lines. If the base is uneven, simple angle-iron tracks can be laid on which the curber can ride. On a previously cleaned surface, a thin coating of rapid curing cutback asphalt is applied to the surface to improve bond. Hot mix then is loaded into the hopper of the curber. The mixture is extruded through the mold form under pressure by a horizontal conveyor screw, driven by a small gasoline engine. The pressure moves the curber forward. A crew of three is required.

Mix design is extremely important. Too much asphalt or an improper amount of mineral filler can be very unsatisfactory. A typical mix recommended by the Michigan Asphalt Paving Association gives a good idea of a successful formula. It consists of 8 to 10% mineral filler, 7 to 8.5 % asphalt cement, 40 to 50 % fine aggregate, and 40 to 50% course aggregate, mixed at 325 deg. and laid at 250 deg.



MOBILE CRANE does fast job of setting prestressed roof beams for new building.

Crane Erects Double-Tees

Mobile rubber-tired cranes are proving to be ideal rigs for fast erecting of precast concrete sections.

A good example of their speed was demonstrated at Elyria, Ohio, where the Concrete Masonry Corporation formed and set 78 double-tee roof slabs for a new equip-

continued on page 32

For more details about the...

NEW GUARANTEED AVAILABILITY PLAN

see a participating Blue Brute distributor

ALABAMA
Ben Williams Equipment Company—Andalusia
H. S. Salmon & Company—Birmingham
CALIFORNIA
West Coast Engine & Equipment Co.—Berkeley
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Vern & Flynn's Rental Service—San Carlos
Kenton Equipment Company—San Diego
COLORADO
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CONNECTICUT
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FLORIDA
Julien P. Benjamin Equipment Co.—Jacksonville
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Highway Equipment & Supply Co.—Orlando
GEORGIA
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Murray Construction Equipment Co.—Buffalo
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NORTH CAROLINA
Spartan Equipment Company—Charlotte
OHIO
Brinker Supply Co.—Cleveland, Columbus, Dover
Beasley-Holmes Company—Toledo
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Herd Equipment Company—Oklahoma City
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Western Equipment Company—Eugene, Portland
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Star Machinery Company—Seattle, Spokane
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CANADA
Precision Machine & Foundry—Calgary, Alberta
West Coast Equipment, Ltd.—Vancouver, B. C.
Hub Equipment, Ltd.—Brockville, Cornwall and Toronto, Ont.
Modern Machinery, Ltd.—Quebec City and Montreal, Quebec

Blue Brute distributors announce

NEW GUARANTEED AVAILABILITY PLAN

an air tool on free loan if your Blue Brute needs repair

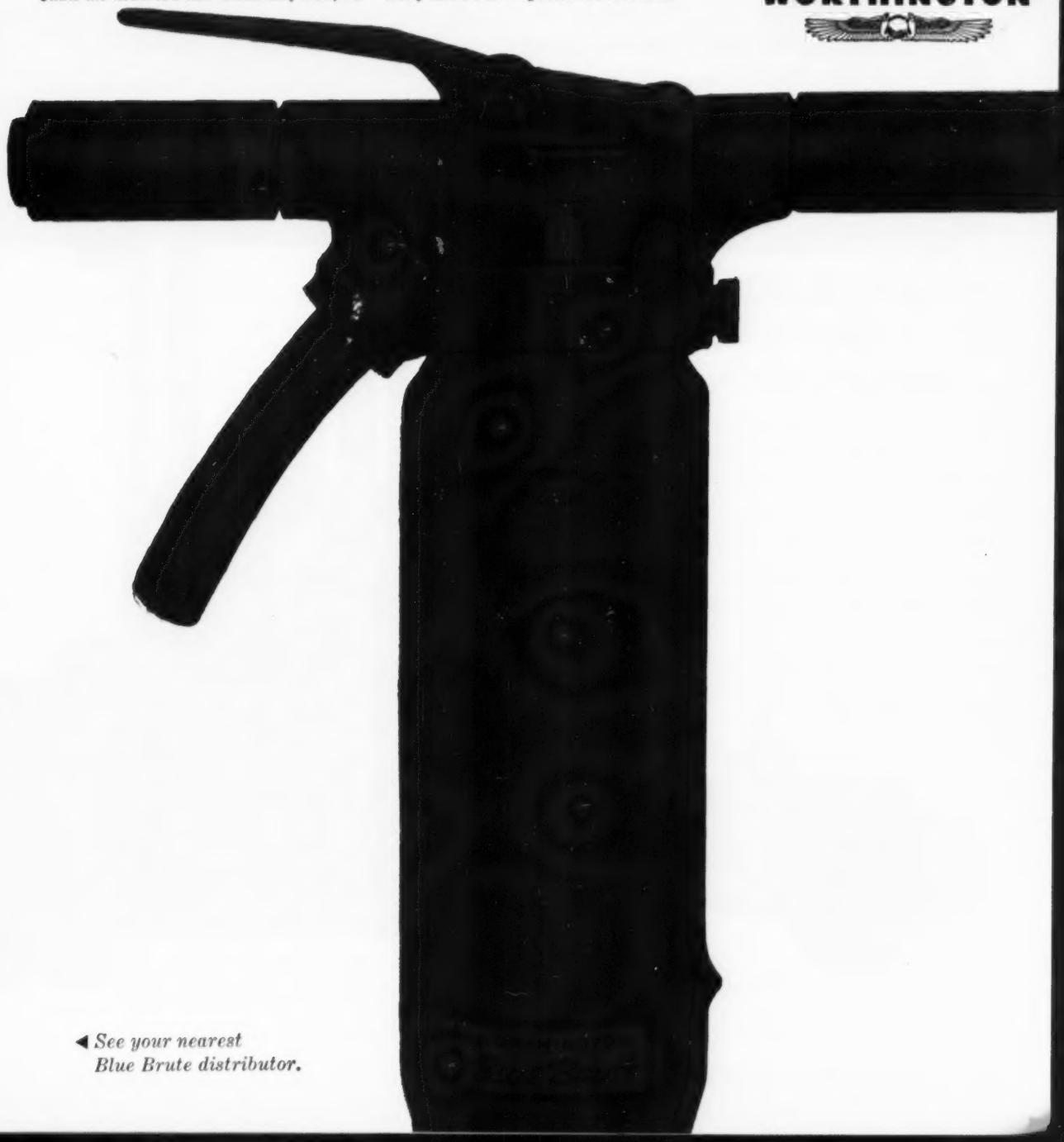
The most important thing about an air tool is to keep it out on the job working. That's why Worthington Blue Brute tools are built for ruggedness—for ability to stand up under day-in, day-out punishment.

Another progressive step in keeping Blue Brute air tools on the job has just been announced. Under the terms of a new Availability Plan, we will lend you an air tool free if any of your hand-held Blue Brute tools is in our shop for repair.

To be sure the tool you need is there when you need it, we have recently enlarged our stock of standard air tools and accessories. We also carry a large inventory of parts so that repairs or replacements can be made quickly and inexpensively on all Worthington Blue Brute tools.

For greater profits keep your air tools on the job by (1) buying Blue Brute tools and (2) taking advantage of the Guaranteed Availability Plan. For complete details on the new plan, ask your nearby Blue Brute distributor for Bulletin G-2500.

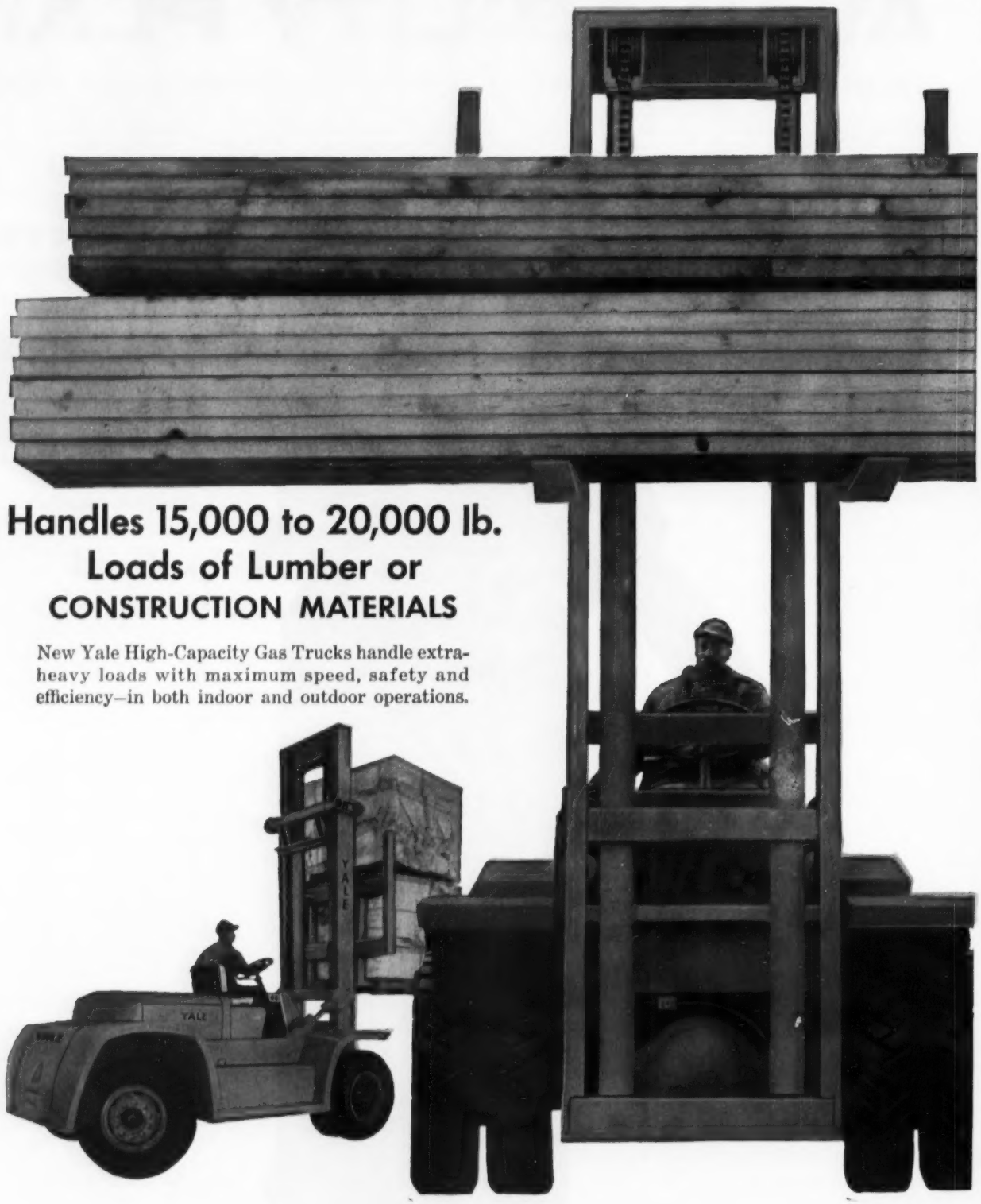
WORTHINGTON



◀ *See your nearest Blue Brute distributor.*

To meet the need of expanding industries for better materials handling methods, look to Yale for advances in research, engineering, manufacturing, sales and service—as YALE BUILDS FOR THE NEW ERA

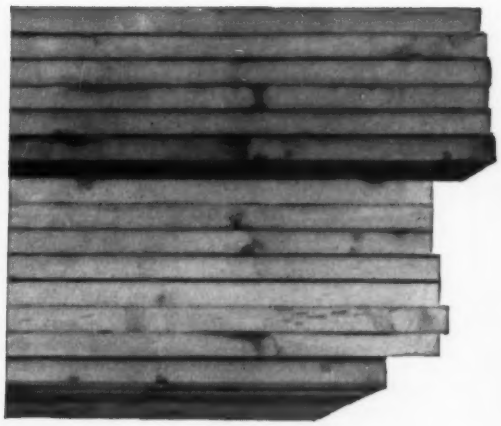
Now...first and



Handles 15,000 to 20,000 lb. Loads of Lumber or CONSTRUCTION MATERIALS

New Yale High-Capacity Gas Trucks handle extra-heavy loads with maximum speed, safety and efficiency—in both indoor and outdoor operations.

only high-capacity gas truck with full visibility



YALE WIDE-ANGLE VISION

300% MORE VISIBILITY THAN ANY OTHER TRUCK OF ITS TYPE! Not just straight-ahead vision—but "corner of the eyes" vision, too—*fully functional* visibility with the big, open look of new Yale High-Capacity Gas Trucks. Operator sits high and in center. Upright channels are wide-spaced, nested to reduce frontal obstruction. Right next to them—the hoisting cylinders, one right, one left. Chains that raise carriage are in front of cylinders—*out* of the arc of vision.

Carriage has one top bar, one bottom bar—good visibility between them at all levels of fork lift. Channel cross members are at channel ends—none between. When an attachment is used, hydraulic hoses are located in front and behind cylinders—not in the line of sight. Whether looking forward or to the rear, the operator sees more. Result: these new Yale trucks with "Wide-Angle Vision" promote safer, faster, more efficient handling of 15,000 to 20,000 lb. loads.

TOP PERFORMANCE UNDER TOUGHEST CONDITIONS

Here are just a few of the premium engineering features—all included as *standard*—that give new Yale Gas Trucks a big edge in stamina and safety under all conditions:

- I-beam side members in frame for extra strength.
- Channels mounted on ball-bearing rollers to reduce friction and wear.
- Ball-mounted, self-aligning hoisting cylinders.
- Gear shift lever, plus hoist, tilt and attachment lever at right side of driver. Directional control lever conveniently located on steering column.
- Power steer with two balanced hydraulic cylinders, one to each rear wheel, to reduce stress on bearing points and linkage.
- Your choice of Yale Fluid Coupling or standard transmission.

GREATER STABILITY. Lifting, lowering, traveling—these Yale trucks keep capacity loads in precision balance! Minimum weaving with full loads, because the trucks are built low—low center of gravity, with high underclearance. Extremely rugged design. Broad lifting base afforded by two ball-mounted lift cylinders. Wide channel-roller spacing at all points of lift, plus side-thrust rollers on channels and carriage, further increase stability factor. Large-size, high-flotation tires give good traction under severest terrain conditions.

FAST CYCLE OPERATION. New Yale High-Capacity Gas Trucks have lifting speeds up to 60 feet per minute; fast, safe lowering; travel speeds up to 20 miles per hour; easy maneuverability.

Designed for complete selection of attachments—engineered for a minimum loss distance.

YALE*

*REG. U. S. PAT. OFF.

INDUSTRIAL LIFT TRUCKS AND HOISTS

YALE & TOWNE

The Yale & Towne Mfg. Co., Materials Handling Div. Manufacturing Plants in Philadelphia, Pa., and San Leandro, California

The YALE & TOWNE Manufacturing Co. Dept. A-335
Roosevelt Blvd., Philadelphia 15, Pa.

Please send the new Yale High-Capacity Gas Truck brochure No. 5230.

Name_____ Title_____

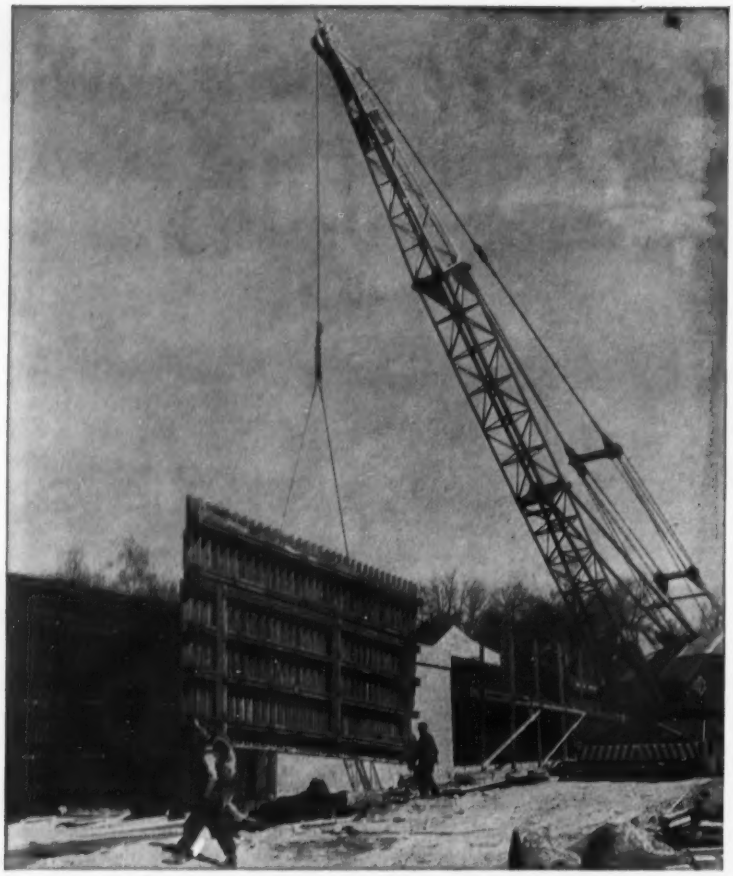
Company_____

Address_____

City_____ Zone____ State_____

In Canada: write The Yale & Towne Manufacturing Co., St. Catharines, Ontario, Canada

Gasoline, Electric & LP-Gas Industrial Lift Trucks • Worksavers • Warehousers • Hand Trucks • Hand and Electric Hoists



Form being moved into position. Back wall form, reinforcing steel, Richmond Tyscrus, are all in place. After front form—which consists of two telescoped panels—has been set down, bolts connecting the panels are loosened so that upper panel can be raised and tilted by crane to required height and shape. Pre-cut plywood will fill gap between two panels. When form is positioned, workmen hook plank scaffolding to walers, fasten ¾" Richmond Tyscrus with seven or eight quick turns. Contractors: Corbetta-Yonkers Contracting.

2-strut, ¾" Richmond Tyscru

Pours Speeded with New Form Method and Richmond Tyscrus

Three miles of retaining walls were needed where the southern end of the New York Thruway cuts through Yonkers. No two sections of the wall are alike; they differ both in height and slope of coping. Corbetta-Yonkers speeded construction by a combination consisting of the use of ingenious telescoping panels fabricated at their yards — and 12,000 lbs. safe load (.340 HT Steel) Richmond Tyscrus for their assembly.

Assembling method is described above. The whole process took less than one hour. Stripping the form was just as easy, with the Tylag backed out of the form. Richmond Tyscrus helped cut costs in other ways too: their built-in extra strength (published load 12,000 lbs.; ultimate strength 20,145 lbs.) means that you can pour fast and heavy in all weather. There is only one threaded connection, with a coarse thread which is self-cleaning when removed from the concrete. Richmond Tyscrus are far more economical than conventional ties.

The new Richmond Handbook describes the full line of Richmond-engineered tying devices. Write for your copy. Or, if you have a specific concreting problem, Richmond's Technical Division or field men will be glad to submit recommendations, drawings and proposals. Write RICHMOND SCREW ANCHOR COMPANY, INC., 816 Liberty Avenue, Brooklyn 8, N. Y. or 315 South Fourth Street, Saint Joseph, Mo.

JOB TALK...
continued

ment maintenance building in its prestressing yard.

Dimensions of the building are 156 ft by 78 ft. It is divided into a 26-ft wide and a 51-ft wide bay by a load bearing partition. All walls are of 12-in. concrete blocks, standing 18 ft. high.

The job of setting the roof slabs began in the afternoon after a 22-½-ton Lorain self-propelled crane had been fitted with 50 ft of boom. The Lorain stood on the concrete floor inside the building and placed one cantilever beam that projected out from the partition and supported the center ends of the first slabs on each bay. (The center partition was constructed 8 ft. short from the end of the building.)

During the afternoon 17 of the slabs for the wide bay were set in place. These slabs were 51 ft. long, 4 ft. wide, and 16 in. deep. They weighed 10,000 lbs each.

Cable slings with 28½-ft legs were set at 45 deg. Each ¾-in. sling leg had a short two-part spreader of ½-in. cable with two hooks. The sling was rigged so that one leg was slightly longer than the other, enabling the two workmen on the roof to position one end of the slab at a time.

To avoid damage to the slab, each of the four hook-on points were in line with the stem of the T-sections and paired 38 ft apart, symmetrical about centerline of the beam. U-bars were cast into the beam at the hook-on points.

The following morning, the remaining 22 long slabs were set. The time to place these slabs averaged 7 min. each. Average swing was 90 deg.

At 2:30 that afternoon, the crane began placing the thirty-nine, 26-ft. long slabs on the smaller bay. Four of these slabs were of the same cross section as the longer bay slabs to match the end of the other bay in appearance. These slabs weighed 5,000 lbs. each. The remaining 35 slabs were 12-in. deep and weighed 3,500 lbs.

Working space was limited by this 26-ft. bay. In addition, the crane had to straddle a 3-ft. wide grease pit that extended most of the length of the bay. Hence, near 180 deg swings had to be made. Despite these handicaps, the placing of the slabs reached a rapid pace. Average time for each slab set was 3.6 min.

LIBERTY MUTUAL THE COMPANY THAT STANDS BY YOU

10

ways Liberty Mutual serves you better

and saves you money

on all your construction insurance needs

The complete story on the following 11 pages

LIBERTY MUTUAL . .

Liberty engineer checks job hazard on Mass. Turnpike before next work stage begins.

1 Advance analysis

The time to stop construction accidents is *before* work begins. Liberty Mutual's construction engineers scrutinize your operations as you have planned them. They spot the hazards and name the cures in advance. The study includes more than blueprints — covers equipment, falsework design, materials handling, traffic plans, etc. Control measures are practical, down-to-earth.

. . THE COMPANY THAT STANDS BY YOU

Liberty Engineer Robert F. Hale at Kaaterskill Creek Bridge, New York.

2

Engineers on the job

The Liberty Engineer follows through as a shirtsleeves assistant, working right with you on the job. He reports to management on each work stage, re-evaluates the Advance Analysis before the next stage begins. He helps instruct workers. He provides technical assistance on such problems as controlling blast damage, testing soil, and determining structural safety. You'll rely on him continually.

Continued on the next 9 pages

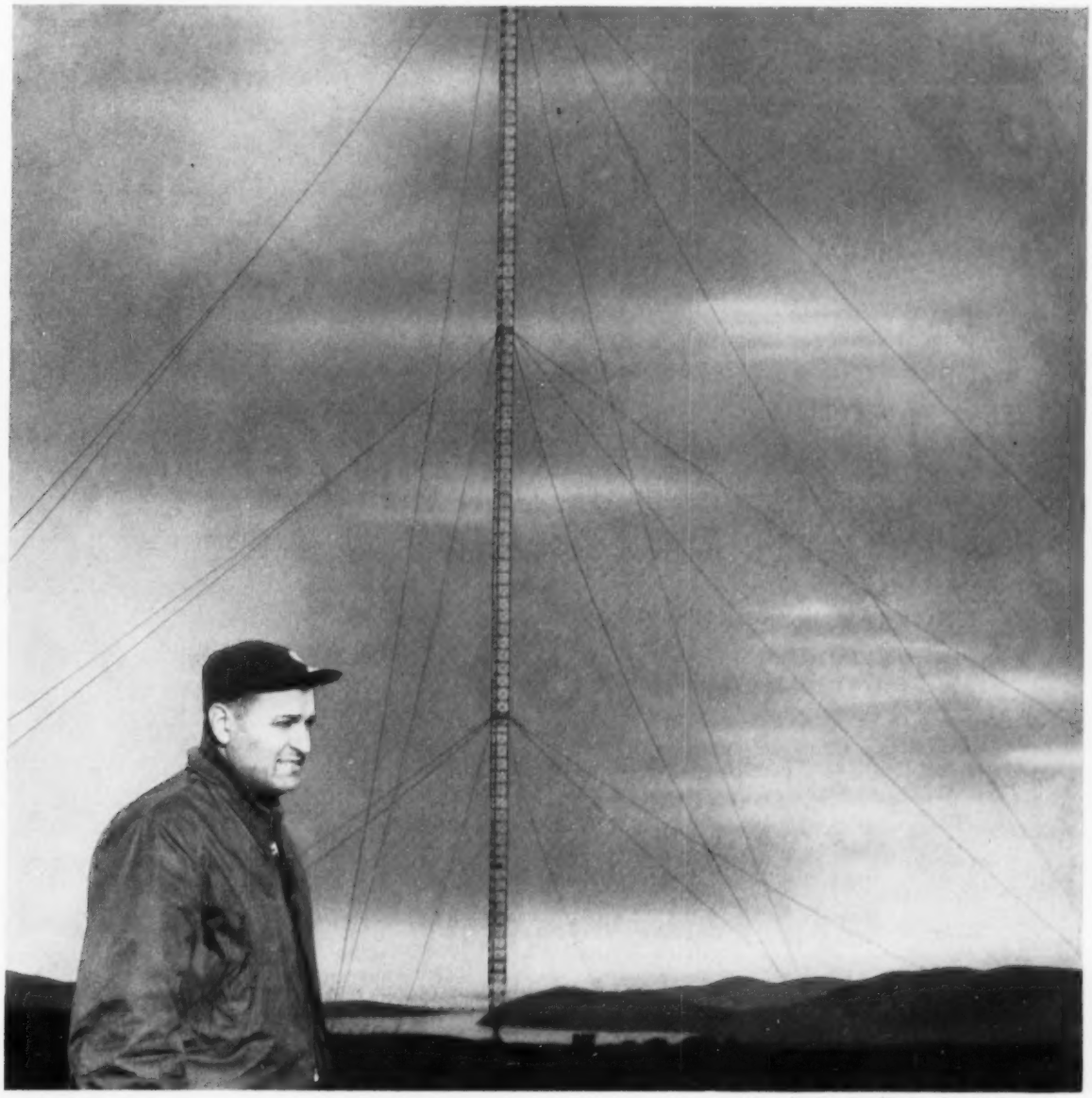
LIBERTY MUTUAL . .

Liberty claimsmen make sure that injured workers receive prompt medical attention.

3 Around the clock claims service

Liberty has 1300 experienced claimsmen working out of 101 offices. If there's an accident on your job, a Liberty claimsman swings into action fast — makes sure proper medical treatment is available. He investigates thoroughly, reports promptly. Where large projects require it, the Liberty claimsman lives on the job. Liberty claims-handling keeps lost-time and compensation costs to a minimum.

. . THE COMPANY THAT STANDS BY YOU



Liberty Engineer Roy Woodworth at Thule, Greenland

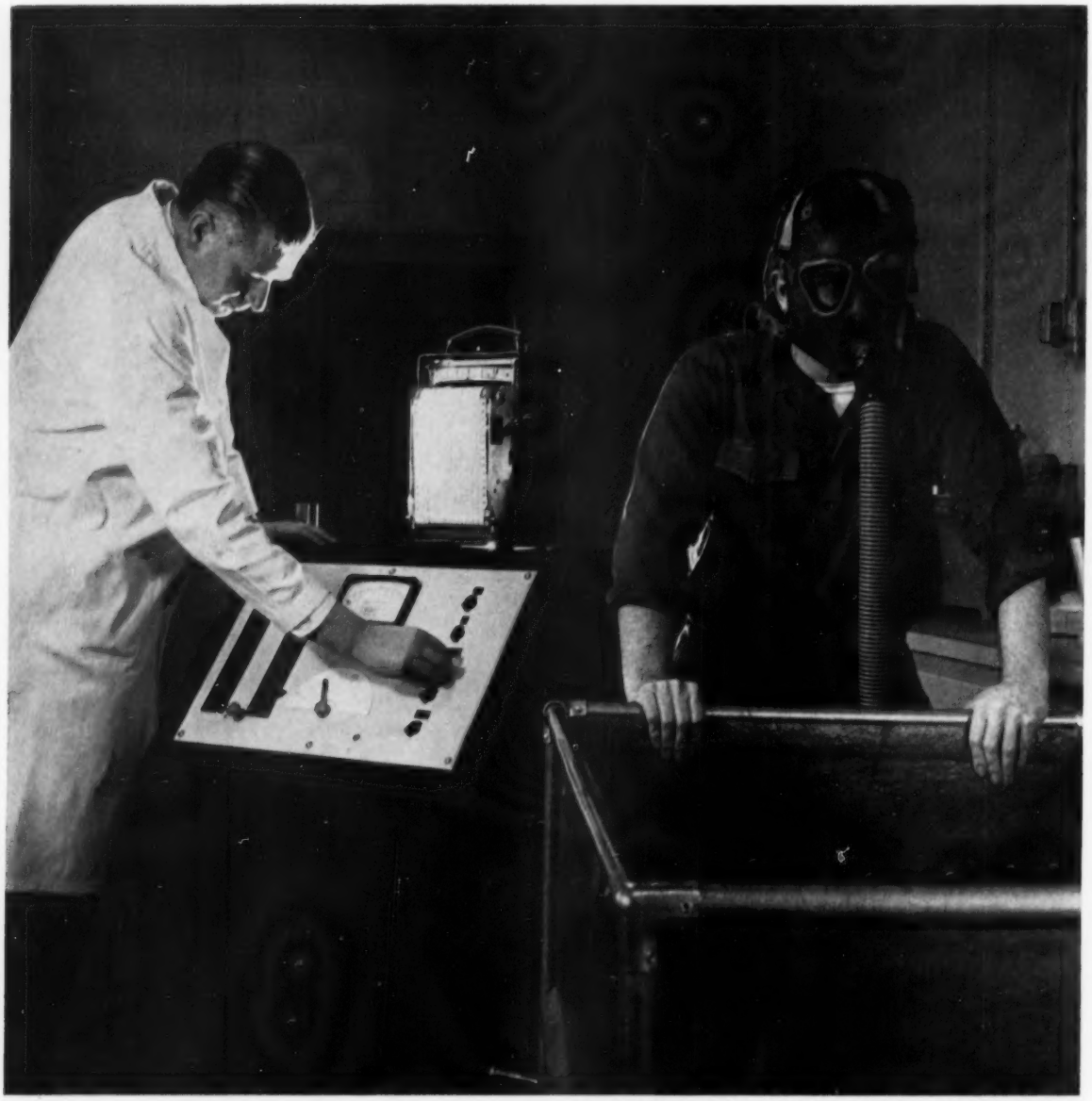
4

Ability to follow your operations

Liberty goes wherever you go. With offices spotted strategically over the United States, it's an easy matter for Liberty to provide fast, experienced help on all jobs. Liberty has also provided insurance on many off-continent construction projects stretching from the Philippines to Thule, Greenland. Liberty claimsmen and engineers work abroad with your employees.

Continued on the next 7 pages

LIBERTY MUTUAL . .

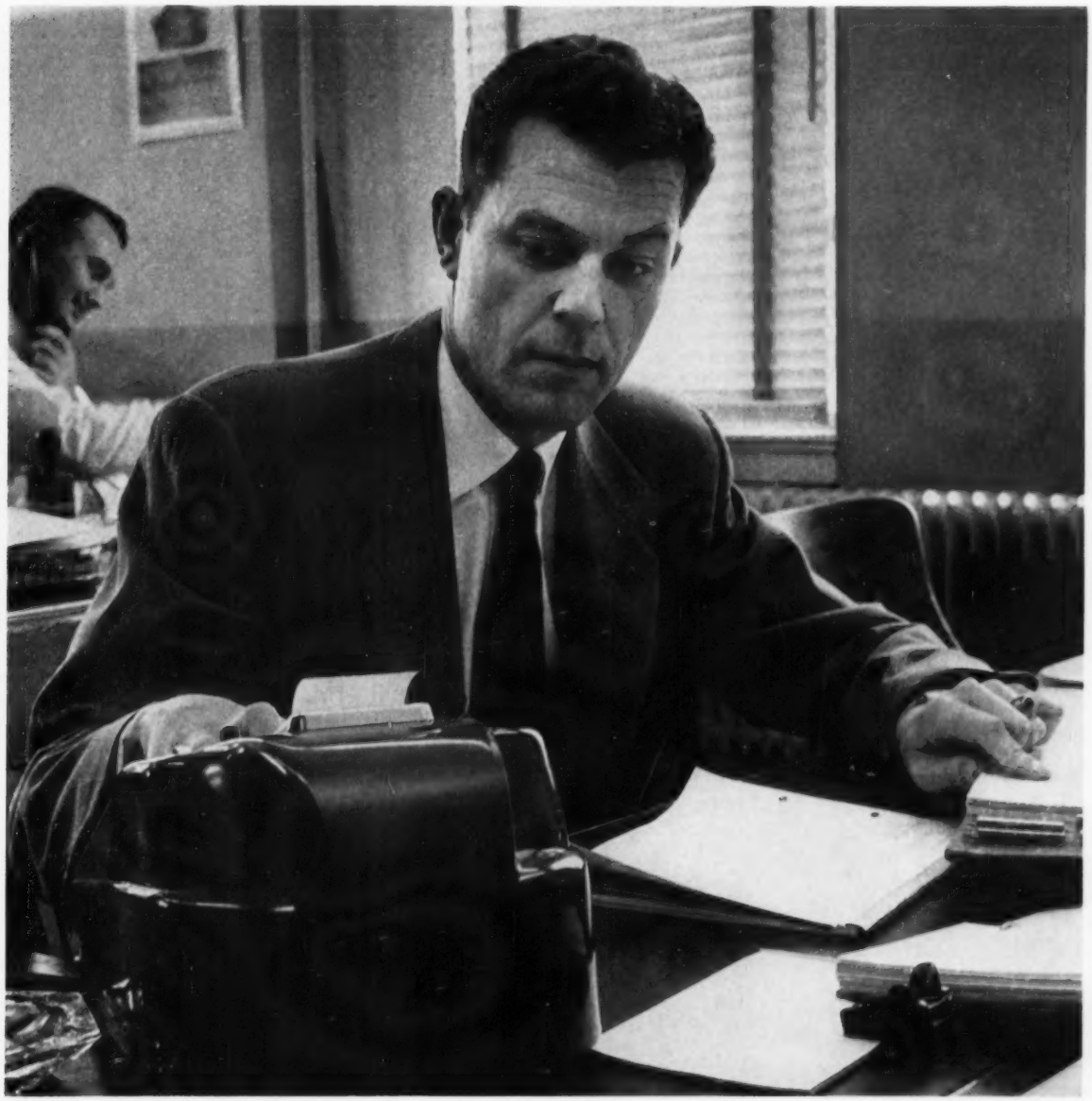


Energy testing device at Liberty Mutual Research Laboratories, Hopkinton, Mass.

5 Safety research

Liberty has its own fully-staffed and equipped laboratory in which it studies overall construction safety, and solves specific problems encountered by individual contractors. Out of this have come many ideas for safer operating methods and new, improved techniques for reducing construction accidents and costs. If the Liberty engineer doesn't have the answer — Liberty research goes to work.

. . THE COMPANY THAT STANDS BY YOU



Liberty auditor, Charles O. McLeod, at contractor's office checking payroll allocation.

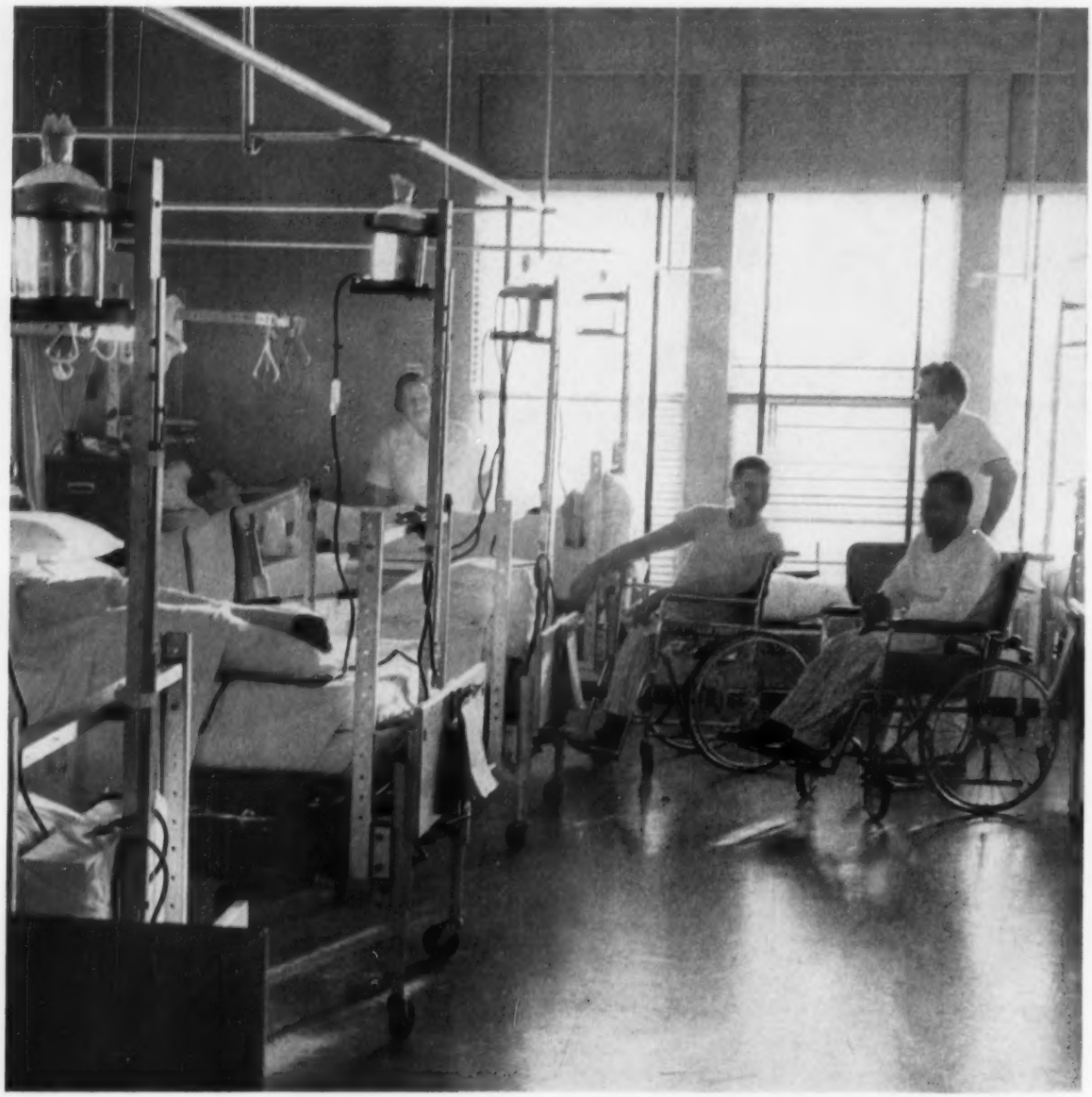
6

Speedy auditing service

Liberty Mutual has its own auditors, specialists in the construction field, who provide fast auditing and assure proper allocation of payroll classification. This thorough, expert auditing can save you money — for it can be very costly when workers are placed in the wrong payroll classification. Good auditing also can improve your position on competitive bids.

Continued on the next 5 pages

LIBERTY MUTUAL . .



Paraplegics at special Boston medical center co-sponsored by Liberty Mutual.

7 Unique medical program

We help you set up a loss-prevention medical program right on the job. When a worker is hurt on a Liberty-insured job — he's in good hands. The claimsman makes sure the best medical care is available. If he's badly hurt, a Liberty specialist follows the case, is always glad to check diagnosis and treatment. The seriously injured worker can go to one of the Liberty rehabilitation centers.

. . THE COMPANY THAT STANDS BY YOU

8

Direct dealing

You deal direct with Liberty Mutual salesmen, underwriters, engineers and claimsmen — all full-time salaried employees of the company. This means you deal with your insurance company itself, not with a broker or middleman, since they do not have Liberty lines to offer you. The entire Liberty team is trained by Liberty, works from Liberty branch offices and its job is to help you, the policyholder, get the most from your Liberty insurance.

Continued on the next 3 pages

LIBERTY MUTUAL . .

9 Savings

As a policyholder of Liberty Mutual, you share in the company's savings.* Through effective methods of loss control, direct-dealing, sound management, and careful operating methods, substantial economies are produced. Savings have been passed on to policyholders. Dividends to policyholders have exceeded $422,000,000 since Liberty Mutual was organized in 1912.

*All Liberty Mutual policies are *non-assessable.*

. . THE COMPANY THAT STANDS BY YOU

New England contractor lowered his cost 42% in 4 years through Experience Modification.

10

Proved ability to lower your costs

Your local Liberty Mutual office can show you an up-to-date list of over 100 contractors whose insurance costs have been dramatically reduced through their Experience Modification with Liberty. This is concrete proof that Liberty's Advance Analysis, superior loss prevention engineering, and expert claims handling create dollar-savings for you.

Continued on the next page

LIBERTY MUTUAL

THE COMPANY THAT STANDS BY YOU

The number 1 writer of compensation insurance for 20 straight years

In the preceding pages you've seen ten ways Liberty Mutual can serve you better and save you money. Contractors all over the country have found it profitable to insure with Liberty. Write your nearest Liberty Mutual office and ask for a list of the policyholders in your area. You probably know some of them personally. Ask these contractor friends of yours what *they* think of Liberty's service.

PLANNING TO BID ON A HIGHWAY CONTRACT? If you are — here's a chance to get acquainted with Liberty Mutual service. Liberty specialists, as a favor to you, will provide you with a detailed estimate of your insurance costs with no obligation on your part whatsoever. Underwriters and engineers will work with you and analyze the problems you'll face in the proposed job. They'll help make sure your bid contains a realistic estimate of your insurance costs. If you would like Liberty to help you on your next bid, get in touch with your local Liberty Mutual office or write Mr. Parker M. Morrell, Liberty Mutual Insurance Company, Boston 16, Massachusetts.

If you'd like to see how your present insurance cost and service compare with what Liberty Mutual offers — clip and mail this coupon. A Liberty Mutual representative will call on you at your convenience.

Liberty Mutual Insurance Company
175 Berkeley St., Boston, Mass.

Gentlemen:
I should like to compare my present insurance with Liberty's service and savings.

Name.....*Title*.....

Address.....

City.....*State*.....

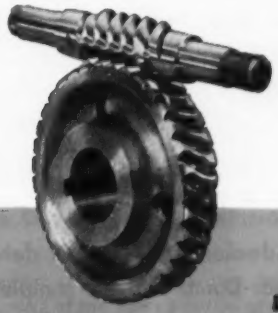
LIBERTY MUTUAL INSURANCE COMPANY
LIBERTY MUTUAL FIRE INSURANCE COMPANY
HOME OFFICE: BOSTON

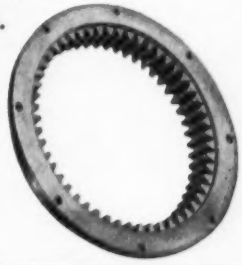
Quality with a pedigree

Every year more and more users of gears who demand the highest quality are turning to ILLINOIS GEAR to meet the exacting needs for this very important part of their equipment or machinery.

They have come to know and depend on ILLINOIS GEAR — a company with a rich heritage in the manufacture of quality gears . . . *from whose modern plants come the most complete line of gears in the world!*

If you use, specify or buy gears for any purpose — look to ILLINOIS GEAR as your most complete and dependable source.





Look for this mark (ILG) *the symbol on finer gears*

ILLINOIS GEARS

Gears for Every Purpose ... one gear or 10,000 or more

ILLINOIS GEAR & MACHINE COMPANY

2108 NORTH NATCHEZ AVENUE • CHICAGO 35, ILLINOIS

Here's the New R-18 "Euc"

that sets a new high in Rear-Dump Production and Performance!

DUMPS FAST AND CLEAN

Smooth body interior and tapered rear chute assures clean shedding of the load well back of the rear wheels—an important feature for dumping into hoppers or over the edge of waste banks.

STAY ON THE JOB LONGER

Rugged body and frame withstand the impacts of loading, hauling and dumping heavy excavation in construction, mine and quarry service.

More Work-ability and Minimum Maintenance

Designed and built for heavy off-the-highway service, Rear-Dump "Eucs" have paced the field for over 20 years. They've reduced hauling costs on hundreds of the toughest jobs in mine, quarry and construction work . . . delivered "plus" performance year in and year out.

This Model R-18 incorporates the engineering advances, the easy operation and maintenance features, resulting from unequalled field experience with other Euclid Rear-Dumps of 10 to 50 tons capacity. It provides the dependable workability that means more payloads per day at lowest cost per ton or yard moved.

Have your Euclid dealer give you full details on this new 18-ton Rear-Dump and the complete line of Euclid earth moving equipment. He'll be glad to show you why so many users have proved for themselves that ***Euclids are your best investment.***

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

The R-18 is your BEST BET for Lower Hauling Costs!

Advanced design results from 20 years of leadership

Some of the* OUTSTANDING FEATURES *of the R-18

- 10½ yd. body 36,000 lb. payload
- 218 h. p.
- loaded top speed of 27 m.p.h.
- hydraulic booster steering
- air assist clutch
- free floating springs
- 16.00 x 25 drive tires

POSITIVE CONTROL OF DUMPING

Double-acting 3 stage Euclid hoist and hydraulic system gives the operator fast, positive control of the body position at all times. Dumping angle of the body, in fully raised position, is 68°. Body, frame and hoist are designed and built as an integral unit.

SPEED AND STABILITY

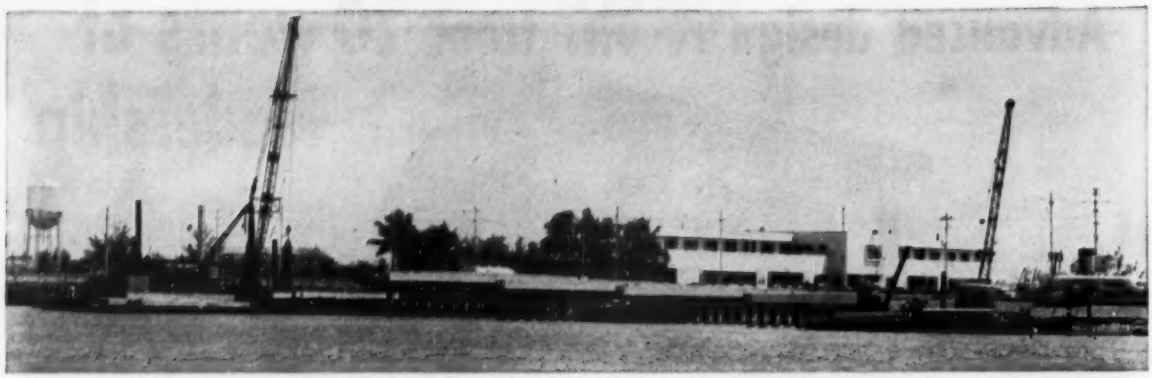
The 5 speed transmission and Euclid planetary axle provide a top speed of 27 m.p.h. with full 18 ton payload. Free floating Euclid spring suspension gives maximum stability empty or loaded under all road conditions... permits faster safe travel speeds.

EASY OPERATION

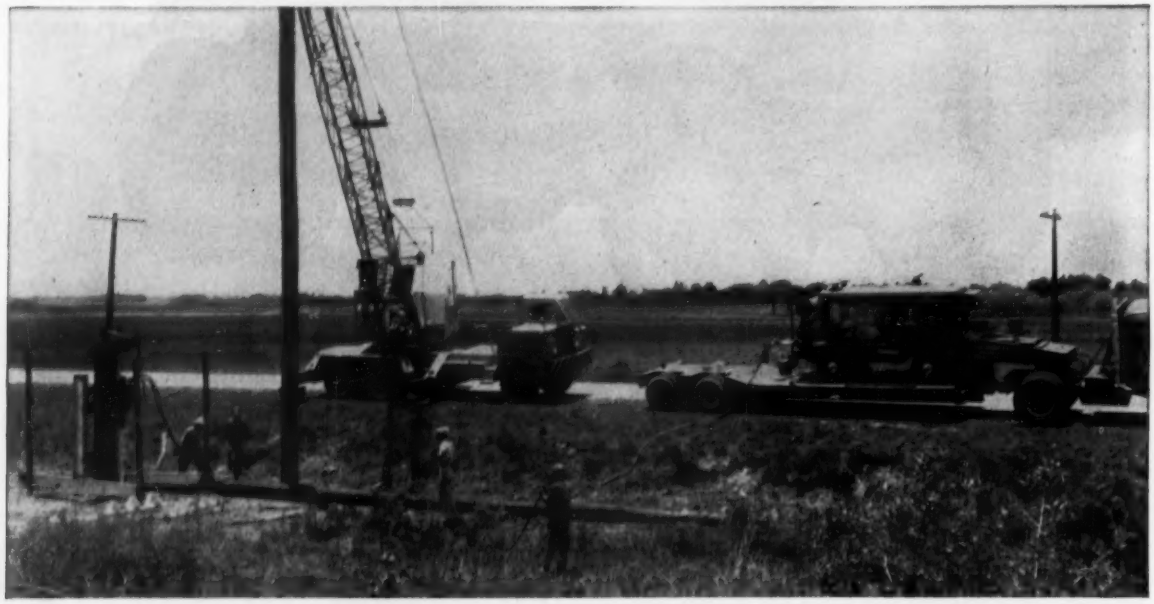
Full width cab offset to left for maximum vision, air assist clutch, booster steering, 218 h.p. engine, fast acting hoist, free floating springs and fully adjustable seat contribute to driver comfort and easy operation.

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE



POWERED BY A JAEGER "600" ROTARY, a Ka-Mo auger rig drilled holes for 700 twenty-inch square pre-cast concrete piles supporting the new causeway bridge across Biscayne Bay between Miami and Miami Beach. Powell Brothers, Ft. Lauderdale, contractor.



DOUBLE TEAMED TO SPEED JOB PROGRESS: Jaeger "600" Rotary powers 18 h.p. Ka-Mo auger drilling 24" holes for 50' to 60' utility poles of the Florida Keys Electric Cooperative. Equipment was trailer mounted to move quickly from pole structure to structure. (More than 700 were installed). All types of strata were encountered in 33 miles between Homestead and Tavernier, Fla., ranging from submerged coral rock to muck. J. K. Sims, sub-contractor, under Leo T. Barber, contractor, both of Moultrie, Ga.

Jaeger-powered drill beats pile driving 8 to 1

On two projects along Florida's Gold Coast, the combination of a Jaeger "600" rotary air compressor and Ka-Mo drill cut difficult pile and pole setting jobs down to size. On both the Florida Keys job shown above and the McArthur Causeway bridge project between Miami and Miami Beach, much of the drilling was in "iron-hard" coral rock, 8' to 10' under water. In a test run for the contractor, Jaeger air easily powered the 24" drill 16' into dry limerock in one hour, saving 7 of the 8 hours previously found necessary to drive a pile into this formation.

The higher efficiency of Jaeger Roto Air Plus® units really cuts your operating and maintenance costs. For example, at full load speed, the Model 6-71 GM diesel engine of a Jaeger "600" runs at only 1650 rpm (100 to 150 rpm slower than other "600" rotaries). This slower, more efficient operation saves fuel, reduces engine piston travel and cuts compressor work as much as 9000 revolutions per hour.

Other Jaeger rotaries (125, 250 and 365 cfm) have this same fuel-saving, wear-saving, high-efficiency performance. See your Jaeger distributor for full details or demonstration — or let us send you Catalog JCR-5.

THE JAEGER MACHINE COMPANY

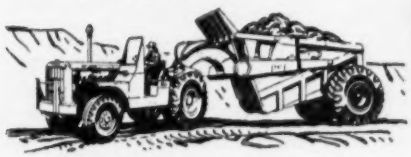
800 Dublin Avenue, Columbus 16, Ohio

PUMPS • CONCRETE MIXERS • SPREADERS • FINISHERS • TRUCK MIXERS

The Right Size and Type Rear Dump

for every tough off-highway job!

34-ton capacity PR21 - DW21, for maneuverability in tight quarters.



PR15 - DW15 — fastest, toughest hauler in the 22-ton capacity class.

34-ton capacity PR20 - DW20, for long hauls, high speeds.

New 31-ton Athey Hydraulic Ejection Trailer handles sticky, hard-to-discharge materials.

Name the materials you handle — Rock or earth — there's an Athey Trailer designed specifically for handling them faster and cheaper than ever before.

Name the tough jobs that beat up haulers — Fast, tough hauls, sloppy footing, big rock, tight quarters — that's the job for an Athey Trailer!

You make your selections from the only *complete* and *proved* trailer line. Select the exact size and features to gear your haul unit to your job. You can depend on them — each Athey Trailer is built to highest standards of quality, design and construction. And Athey Trailers set the pace for lower cost, fast dumping, greater maneuverability, easier loading and higher production.

Ask your Athey-Caterpillar Dealer for all the facts on the complete line of quality-built Athey products today — he will gladly help you select exactly the right Athey-Caterpillar hauling unit for your off-highway job. Or write us for literature. ATHEY PRODUCTS CORPORATION, 5631 West 65th Street, Chicago 38, Ill.

THE *Complete* TRAILER LINE... *by the Leader*

Athey

New capacity!

The completely new Forward Control 'Jeep' FC-150—the first time a 4-wheel-drive Truck has so effectively combined maximum cargo capacity with exceptional maneuverability! New Forward Control design puts a 74" pickup box on an 81" wheelbase. And the FC-150 retains famous 'Jeep' ruggedness and versatility.

New maneuverability!

It's the world's shortest turning 4-wheel-drive Truck! For safer off-road maneuverability, it gives you up to 200% greater forward visibility. Powered by the engine that made 'Jeep' vehicles famous, the new FC-150 provides the extra traction of 4-wheel drive for off-road travel, shifts into 2-wheel drive for highway travel.

New style!

The new look and feel of tomorrow! The FC-150's Safety-View Cab combines beauty with utility. Its new wrap-around windshield is the largest in the 5,000 GVW class. There's plenty of extra leg and head room. Here is new styling, comfort, convenience and safety all in today's most advanced 4-wheel-drive Truck.

New 'Jeep' *Forward Control* *4-Wheel-Drive* **FC-150**

Willys... world's largest makers of 4-Wheel-Drive vehicles

...other members of the famous 'Jeep' family:

Universal 'Jeep' | 'Jeep' Truck | 'Jeep' Utility Wagon

See 'Jeep' vehicles at your WILLYS dealer

Construction Machinery Price Trends

Price Index

	MARCH 1957	MONTH AGO	YEAR AGO	PERCENT CHANGE 1956-'57
All Types of Equipment	156.6	156.3	143.5	+ 9.1
Cranes, Draglines, Shovels	**158.0**	**157.2**	**144.4**	**+ 9.4**
Shovel, ½ cu yd	150.3	149.0	141.5	+ 6.2
Shovel, ¾ cu yd	160.2	158.9	148.3	+ 8.0
Shovel, 1-1½ cu yd	167.9	165.8	152.3	+10.2
Shovel, 2 cu yd	141.3	139.2	131.3	+ 7.6
Shovel, 3-3½ cu yd	154.1	154.1	138.6	+11.2
Shovel, 6 cu yd	170.9	170.9	153.6	+11.3
Crane, truck mounted	161.0	161.0	150.1	+ 7.3
Bucket, clam shell	152.7	152.7	132.0	+15.6
Bucket, dragline	180.8	180.8	160.0	+13.0
Crane, tractor mounted	126.6	126.6	120.3	+ 5.2
Scrapers and Graders	**148.9**	**148.9**	**138.1**	**+ 7.8**
Scraper, 4 Wheel, 8-8.4 cu yd	145.2	145.2	132.9	+ 9.3
Scraper, 4 Wheel, 14.4-15.2 cu yd	140.6	140.6	129.1	+ 8.9
Scraper, 2 wheel	113.6a	113.6a	107.0a	+ 6.2
Grader, heavy duty	154.1	154.1	142.6	+ 8.1
Grader, light & medium	152.2	152.2	140.9	+ 8.0
Tractors	**168.7**	**168.7**	**153.7**	**+ 9.8**
Wheel type, off-highway	118.6a	118.6a	109.3a	+ 8.5
Crawler type, 37.0-45.1 dhp	171.9	171.9	151.8	+13.2
60.5-75.0 dhp	174.8	174.8	155.3	+12.6
102.0-116.0 dhp	172.3	172.3	158.6	+ 8.6
126.0-155.0 dhp	178.0	178.0	161.7	+10.1
Machinery, Tractor Mounted	**154.3**	**154.3**	**141.8**	**+ 8.8**
Dozer, cable control	149.0	149.0	146.3	+ 1.8
Dozer, hydraulic control	169.8	169.8	151.3	+12.2
Cable, power control unit	136.6	136.6	130.3	+ 4.8
Loader, shovel type	146.5	146.5	131.1	+11.7
Specialized Machinery	**142.5**	**142.5**	**133.8**	**+ 6.5**
Ditcher	151.8	151.8	140.8	+ 7.8
Roller, tandem	172.8	172.8	158.3	+ 9.2
Roller, 3 wheels	148.6	148.6	139.3	+ 6.7
Ripper and rooter	132.8	132.8	120.7	+10.0
Dewatering pump, 10 M gph	108.1	108.1	105.4	+ 2.6
Dewatering pump 90M gph	133.3	133.3	124.3	+ 7.2
Portable Air Compressors	**146.2**	**146.2**	**132.0**	**+10.8**
Contractors Air Tools	**150.0**	**150.0**	**135.7**	**+10.5**
Mixers, Pavers, Spreaders	**141.9**	**141.7**	**133.3**	**+ 6.5**
Mixer, port., 11 cu ft	150.5	150.5	145.3	+ 3.6
Mixer, port., 16 cu ft	152.6	152.6	144.8	+ 5.4
Mixer, truck, 4½ cu yd	121.5	120.1	113.7	+ 6.9
Mixer, paving, 34 cu ft	166.8	166.8	153.7	+ 8.5
Concrete finisher	166.3	166.3	158.0	+ 5.3
Bituminous distributor	115.9	115.9	108.3	+ 7.0
Bituminous spreader	160.4	160.3	137.2	+16.9
Bituminous paver	149.8	149.8	143.9	+ 4.1

a Index based on January, 1955 = 100

BLS Primary Market Price Indexes, U.S. Department of Labor, 1947-49 = 100

March Brings Few Price Increases

SCATTERED price increases for a few types of construction machinery pushed average prices up a slight 0.2% in March. The Bureau of Labor Statistics index of manufacturers' prices moved to a new all-time high of 156.6 for the month. This latest index value is 9.1% higher than a year ago.

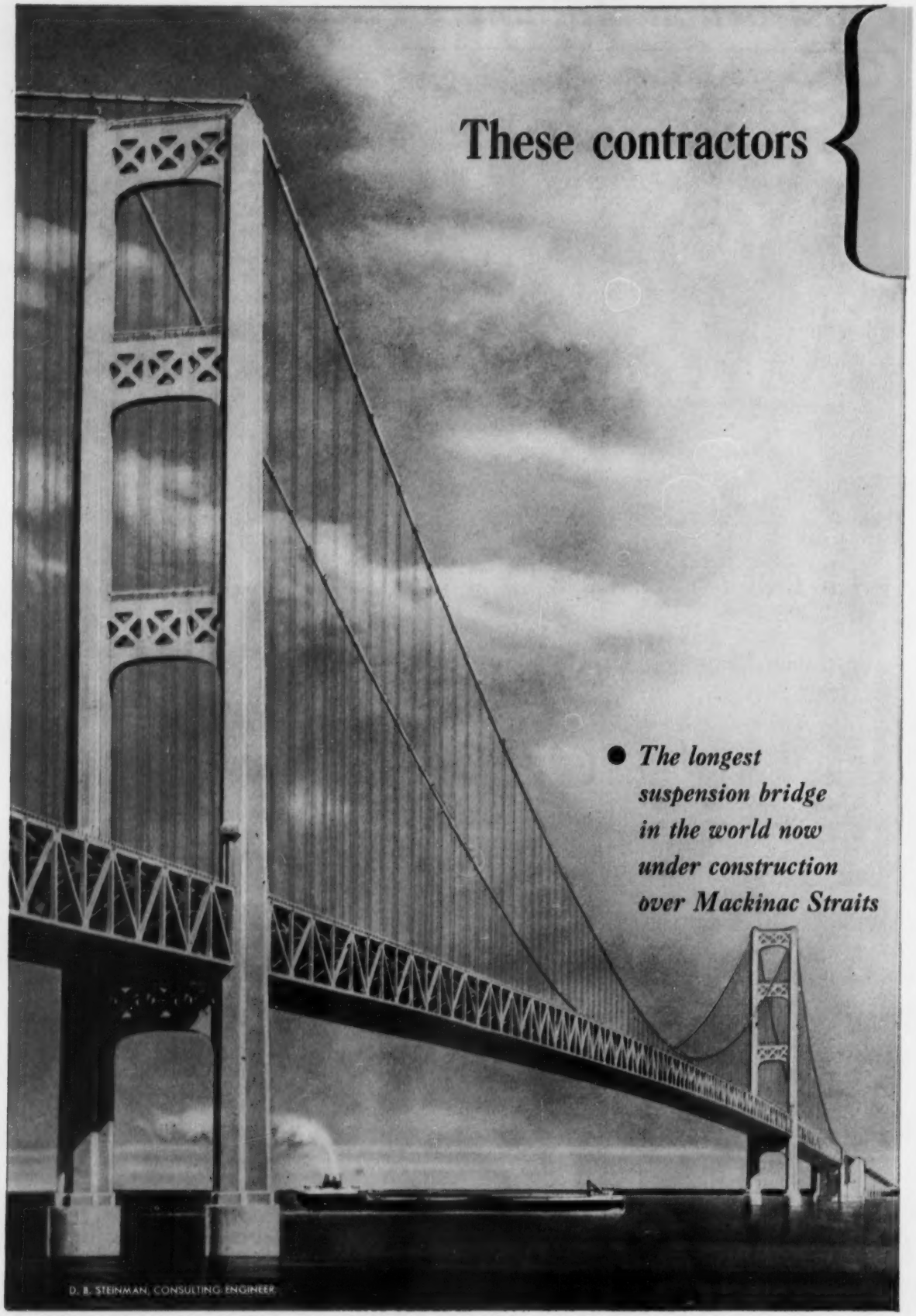
Most of the March price hikes came on power shovels in the ½ cu yd to 2 cu yd size range. The increases were greatest for the larger sizes in this range.

Price increases during March also showed for truck mixers and bituminous spreaders.

Construction contractors ordered about the same dollar value of new excavating and earthmoving equipment in March as they did in February. The New Orders Index was 256 in March as computed by the McGraw-Hill Department of Economics. This is close to the values of 258 in February and 267 in January.

But March was the first month in 1957 when construction machinery orders failed to top the corresponding month a year ago. In fact, the index dropped 11% below March, 1956, when there was an exceptionally large order volume. This year-to-year drop pulled the overall gain over 1956 from 12% at the end of February to only 3% for the first quarter.

However, the decline in orders probably will not last long. Private construction contracts started in mid-April to pull out of a deep slump. This snappy upturn in private work, plus the continuing boom in public heavy construction, should result in a rise in construction machinery sales.


These contractors
● The longest suspension bridge in the world now under construction over Mackinac Straits
D. B. STEINMAN, CONSULTING ENGINEER

Merritt-Chapman & Scott Corporation and American Bridge Division of U. S. Steel Corporation

use Shell Lubricants in the construction equipment on Mackinac Bridge project

Today's engineering knowledge and modern construction equipment are making the mighty Mackinac Bridge a reality. This equipment requires oils and greases which will remain stable and give adequate lubrication at extreme temperature ranges. To keep their heavy-duty machines operating at maximum efficiency with a minimum of down time, both companies, Merritt-Chapman & Scott Corporation and American Bridge, chose Shell Lubricants and Fuels.

The Mackinac Bridge project is just one of the many construction operations where equipment was lubricated and protected by Shell products. Wherever *heavy-duty* equipment operates, Shell Lubricants and Fuels are being used to keep machinery in top operating condition and hold maintenance costs down. Perhaps it will pay you to investigate the savings that can be realized through the use of Shell Industrial Lubricants and Fuels.

SHELL OIL COMPANY SUPPLIES:

Gasoline	Solvents
Fuel Oil	Motor Oils
Diesel Fuel	Anti-Freeze
Kerosene	Greases
Industrial Lubricants	Outboard Motor Oil

and many other fuels and lubricants

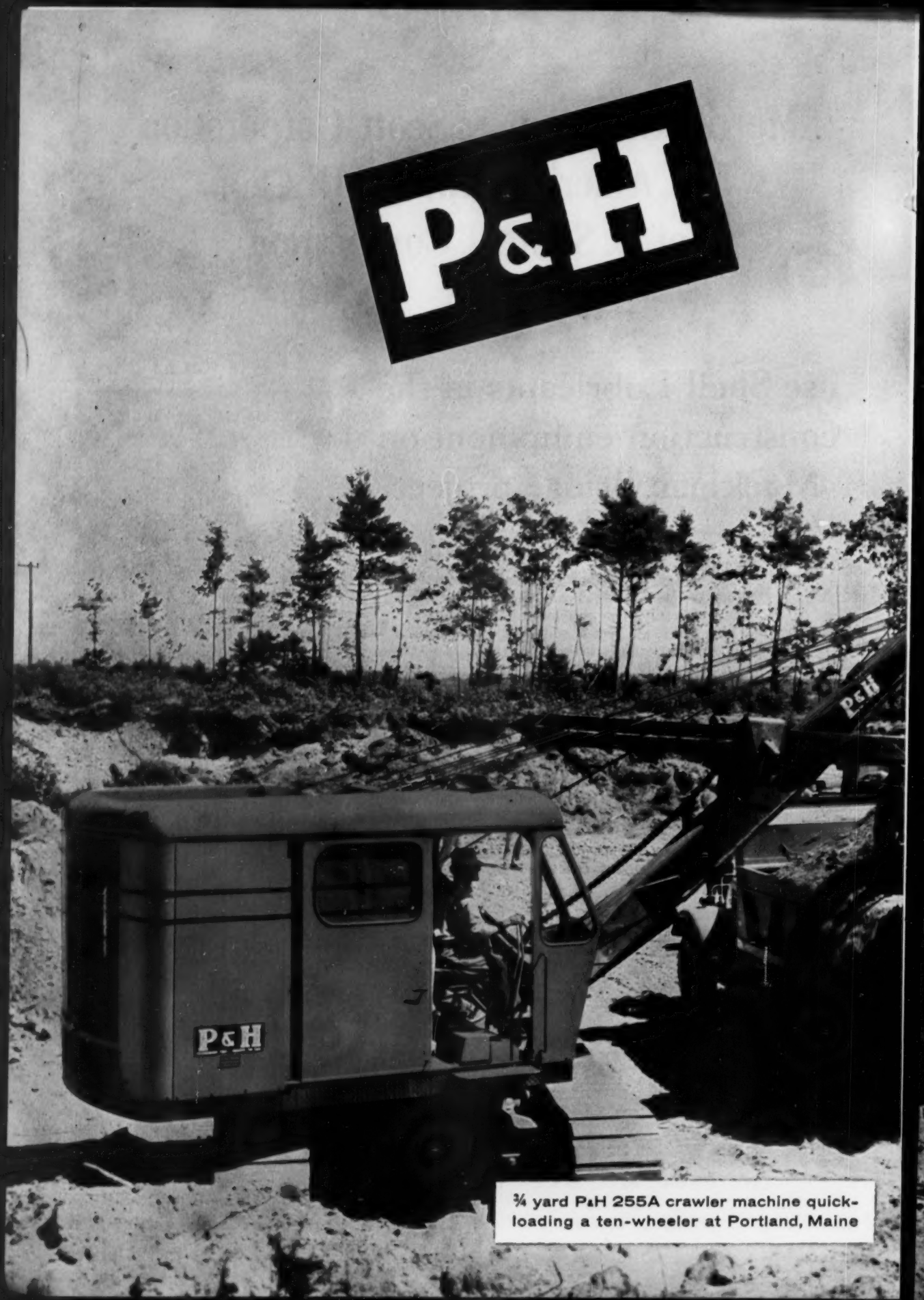
American Bridge Division of U. S. Steel Corporation has strung a total of 12,500 tons of cable as part of the 66,500-ton superstructure.

One of the 34 piers of the bridge substructure built by Merritt-Chapman & Scott Corporation

SHELL OIL COMPANY

50 West 50th Street, New York 20, N. Y. • 100 Bush Street, San Francisco 6, Calif.

SHELL



¾ yard P&H 255A crawler machine quick-loading a ten-wheeler at Portland, Maine

3/4 yd. shovel has a mighty appetite

P&H 255A–first ¾ yd. power shovel--still the leader

P&H was the first to introduce a power shovel in the ¾ yard class and with today's P&H features the 255A continues to lead in profitable performance.

Contractors agree that the 255A with its dependable day-in and day-out production can dig more and lift more—faster and cheaper. In fact, many contractors agree that performance of P&H equipment is the big factor in determining their profits.

P&H profitable performance comes from a combination of features that are found only in P&H quality equipment. In the 255A you get famous P&H stability through better weight distribution and a low vertical center of gravity. You get smooth, fast, lively swings on the mammoth P&H live roller circle. P&H designed double adjustable hook rollers assure "even keel" swings. The 255A makes maximum use of alloy steel.

Add to these features the fact that equipped with a P&H Diesel Engine with its greater torque you'll get much greater production than with a gas engine. Yes!—this ¾ yard excavator has the mightiest appetite for work—at a potential profit.

Harnischfeger Corporation
Construction & Mining Division
Milwaukee 46, Wisconsin

THE P&H LINE Truck Cranes: 8, 10, 15, 20, 25, 30, 35 and 45 tons
Shovels: ½, ¾, 1½, 1¾, 2½, and 3½ yards

Across the country P&H machines lead the field in power, speed, flexibility, and profitable performance

CALIFORNIA
For handling loads up to 35 tons profitably there is the P&H 555A-TC. Here are Reliance Equipment's two 555A-TC units double lifting a precast concrete panel in the Vail Field Industrial Area, Los Angeles.

LOUISIANA
In the 1½ yard class, Schwartz Supply Co. profits from the lively swings and dependable performance of the P&H 655B. It is shown unloading material for their concrete mixing plant near New Orleans airport.

OHIO
Beavercreek Excavating Co. of Dayton depends on their ½-yard P&H 155A trench hoe to dig water mains and lay pipe economically and at a profit on State Highway 4 project in Butler County.

Write today For Bulletin X-71 On the P&H 255A Fully Convertible Crawler Machine

Harnischfeger Corporation, Dept. 509-E
Construction & Mining Division
Milwaukee 46, Wisconsin, U.S.A.

Gentlemen:
Please send me Bulletin X-71 on the ¾ yard P&H 255A

*Name*_____

*Title*_____

*Firm*_____

*Street*_____

*City*_____ *Zone*_____ *State*_____

Strong candidate for
"MOST USEFUL MACHINE"

John L. Bellinger, President of K.E.B. Constr. Co., Inc., North Syracuse, N. Y., sizes up the CAT* D4 Tractor-No. 40 Scraper Unit as follows:

"This is one of the most useful pieces of machinery we own, for we can do so many jobs with it. We clear land, build roads, carry fill and dig cellars, all with this one unit. It has proven its value in our work."

The job pictured here is on a residential housing development near DeWitt, N. Y. The sturdy D4 Tractor has plenty of power to self-load the scraper in clay and hardpan, averaging a heaped 4.5 cu. yd. per load. For land clearing and rough grading the scraper is quickly detached and the No. 4A Bulldozer takes over.

The D4 fills an important place in practically any spread. It's a handy size, small enough to be moved easily from job to job; big enough to give you real production. Teamed up with the No. 40 Scraper on short hauls, its performance often rivals that of larger machines.

The Caterpillar Engine delivers 50 drawbar HP and gives the tractor 10,700 lb. maximum drawbar pull. It's economical on fuel, using No. 2 furnace oil without fouling. The optional oil clutch adds easy shifting, long life and simplified maintenance.

Designed to match the D4 for top efficiency, the No. 40 Scraper loads fast, has quick, positive ejection and is ruggedly built to stay on the job. Your Caterpillar Dealer can show you how these units can make money for you. Ask him for a demonstration on your own job. He backs the long productive life of the machines he sells with reliable service and Caterpillar parts.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

WANTED—
THE HARD WORK

States Budget . . .

Record Highway Contracts

- **Total zooms 51% above last year**
- **Interstate projects account for all of the rise**
- **Contract maintenance increases**

STATE highway departments are going to push project Better Roads at a pace that will have contractors on the go this year like never before. Forty-five states and the District of Columbia are budgeting a whopping $3,630 million in 1957 highway construction contracts. This is a 51% jump over their budgets for last year, the most sensational year-to-year rise ever reported in **Construction Methods** annual survey of state highway department contract budgets.

Several states plan to more than double their contract awards this year. And 25 states will up their lettings by more than 50% (see table).

The new interstate highway construction program is responsible for all of the increase in the budget total. In fact, interstate projects will contribute $1,719 million, nearly half of the total contract budget.

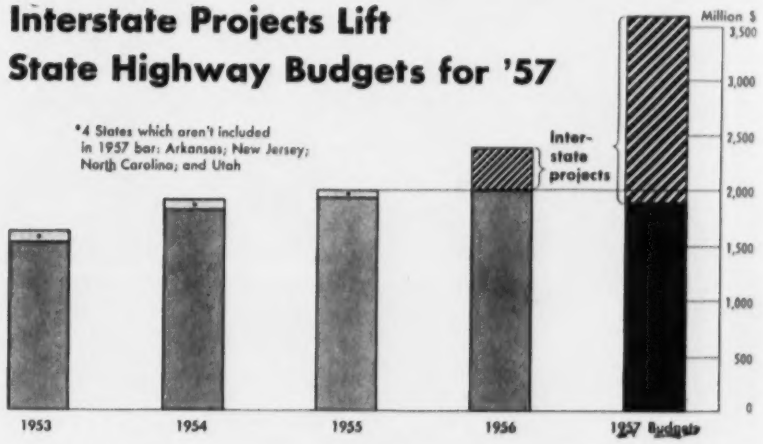
Toll Roads Down But Not Out

This booming volume of new work on the free highway system is not all of the story for 1957. Toll road contracts will add more than $200 million to highway contractors' new business. Though this is only a little more than half of the nearly $400 million in toll road contracts awarded in 1956, it represents a big source of highway awards in two states in particular.

The New York State Thruway Authority reports it is budgeting $101 million in 1957 contracts, only a little less than its 1956 total of

continued on page 60

Interstate Projects Lift State Highway Budgets for '57



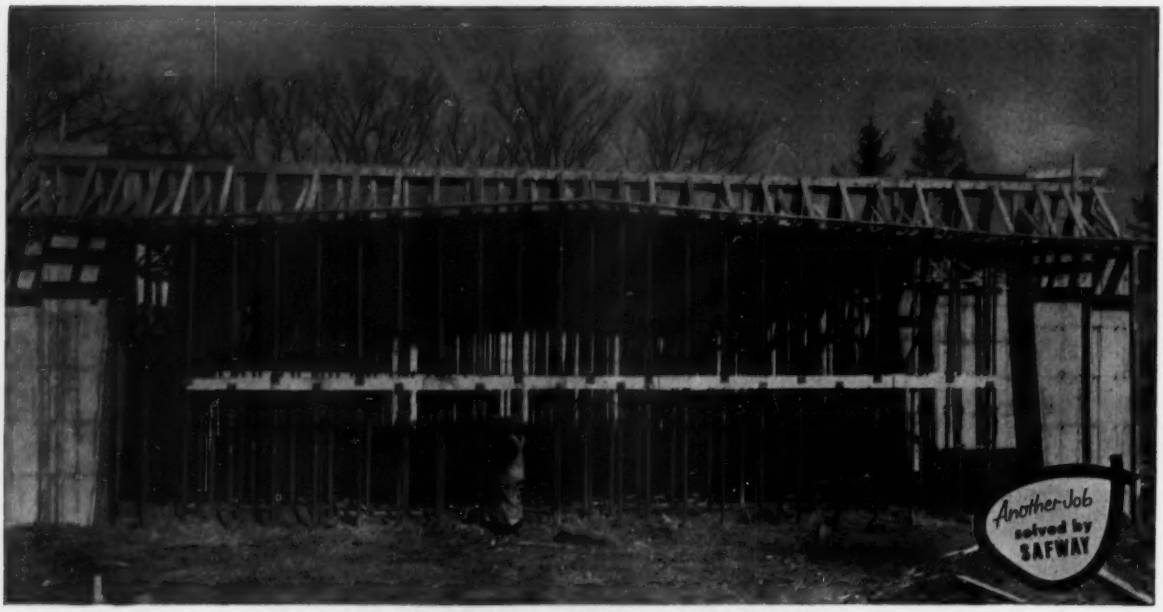
State Highway Budgets for 1957

Reported by State Highway Departments in thousands of dollars

STATE AND REGION	TOTAL CONTRACTS Scheduled 1957	TOTAL CONTRACTS Percent Change	INTERSTATE CONTRACTS Scheduled 1957	INTERSTATE CONTRACTS Percent Change	MAINTENANCE By Own Forces 1957	MAINTENANCE By Own Forces Percent Change	MAINTENANCE By Contracts 1957	MAINTENANCE By Contracts Percent Change	TOTAL CONTRACTS AND MAINTENANCE 1957	TOTAL CONTRACTS AND MAINTENANCE Percent Change
Maine	$30,000	+35	$5,000	+35	$12,500	+6	0	.....	$32,500	+22
New Hampshire	25,000	+233	16,000	+1,782	7,000	+15			32,000	+135
Vermont	11,000	+24	6,500		8,000	+9	120	0	16,120	+19
Massachusetts	108,700	+32	44,780	+234	2,985a	+9	1,335	+13	113,020a	+31
Rhode Island	19,000	+90	13,000	+333	2,900	+6			21,900	+72
Connecticut	69,006	+130	24,000	+700	10,400	+2	400	−2	79,800	+97
NEW ENGLAND	**252,700**	**+64**	**109,250**	**+356**	**40,785**	**+7**	**1,855**	**+8**	**295,340**	**+53**
New York	300,000b	+24	135,000b	+158	36,702b	−3	100b	+317	336,802b	+20
New Jersey	n.a.		n.a.		n.a.		n.a.		n.a.	
Pennsylvania	225,420	+125	109,100	+355	40,000	+3	300	+50	265,720	+91
Maryland	73,000	+31	18,900	+41	7,104	+15			80,104	+20
District of Columbia	13,744	+331	9,514	.....	1,204	+9	871	+15	15,819	+213
Delaware	15,000	+11			3,992f	+21	n.a.		18,992	+13
MIDDLE ATLANTIC	**627,164**	**+60**	**272,414**	**+201**	**88,702**	**+2**	**1,271**	**+31**	**717,137**	**+42**
Virginia	63,118	+95	28,785	+412	23,600	+7	4,500	+13	91,218	+56
West Virginia	30,201	+128	23,027	.....	24,400	−4	n.a.		63,601	+39
North Carolina	g		g		n.a.	n.a.	n.a.		n.a.	
South Carolina	48,970	+76	18,900	+552	10,000	+8	3,000	+11	61,970	+56
Georgia	70,000	+90	20,000	+541	10,500	−1	0		80,500	+70
Florida	125,000	+71	40,000	+2,691	12,500	+19	4,000	+23	141,500	+63
Alabama	63,000	+23	33,000	+1,550	8,000	−34			71,000	+12
Mississippi	60,100	+228	33,200	+2,253	6,700	+12	0		66,800	+175
Louisiana	98,000	+66	80,000		17,500	+17	0		112,500	+41
Kentucky	40,000	+40	20,000		18,500e	+18	3,000e	−12	61,500	+29
Tennessee	50,000	−7	31,000	+1,542	9,400	+11	0		59,400	−5
SOUTHERN	**654,389**	**+62**	**297,912**	**+1,521**	**141,100**	**+4**	**14,500**	**+8**	**809,989**	**+47**
Ohio	284,000	+56	161,700	+327	27,500	+6	8,500	−11	290,100	+46
Indiana	55,000	+100	25,000	+12,400	15,000	+15	175	+46	70,175	+73
Illinois	193,400	+122	122,700	+780	21,800	+20	2,500	−22	217,700	+101
Wisconsin	89,970	+30	23,380	+1,967	*3,000	+15	500	−17	83,470	+27
Michigan	169,000	+49	67,000	+63	22,000	+5			191,000	+42
MIDDLE WEST	**741,370**	**+67**	**399,780**	**+325**	**99,460**	**+11**	**11,675**	**−14**	**852,445**	**+58**
Minnesota	50,000	−11	15,000	+80	1,000	0	3,000	0	54,000	−10
Iowa	94,200	+99	50,000	+1,026	9,462	+8	1,278	+10	104,940	+83
Missouri	98,478	+48	51,163	+525	22,300	+5			120,778	+37
Arkansas	d		n.a.		n.a.		n.a.		n.a.	
North Dakota	35,000	+67	18,000	+950	4,000	+22	300	−36	39,300	+59
South Dakota	45,000	+70	18,000	+424	7,310	+5	590	+43	52,900	+55
Nebraska	29,500	+49	11,500		8,500	+8	850	+8	38,850	+36
Kansas	65,000	+44	20,000	+257	11,150	+9	2,600	+4	78,750	+36
Oklahoma	64,000	+66	26,000	+79	10,218	−17	500	−40	74,718	+45
Texas	275,000	+22	140,000	+324	35,000	+6	0		310,000	+20
Montana	34,000	+35	4,000	+233	6,957e	+5	428e	+43	41,385	+30
Wyoming	31,934	+64	19,078	+392	3,500	+6	0		35,334	+55
Colorado	86,000	+60	25,000	+213	9,000	+13	1,000	+100	96,000	+52
New Mexico	45,500	+54	25,500	+188	6,350	−3	150	−57	52,000	+43
WEST OF THE MISSISSIPPI	**923,612**	**+41**	**420,241**	**+318**	**135,347**	**+4**	**10,696**	**+4**	**1,060,855**	**+35**
Idaho	20,000	+59	10,000	+168	3,000	+36	1,800	+12	24,800	+51
Utah	33,390c	+232	29,960c	+4,820	4,365c	+11			37,756	+170
Arizona	31,006	+38	20,000	+639	4,009e	+28			35,006	+37
Nevada	20,000	+67	9,000	+500	3,200e	+16			23,200	+57
Washington	60,000	+33	35,000	+150	9,500	0	1,000	0	70,500	+27
Oregon	41,000	+61	24,000	+258	11,000	−1	1,500	−3	53,500	+60
California	225,700	+9	91,445	+93	25,700	+3			251,400	+8
FAR WEST	**431,096**	**+29**	**219,405**	**+187**	**60,771**	**+8**	**4,300**	**+4**	**496,161**	**+25**
UNITED STATES	**$3,630,225**	**+51**	**$1,719,002**	**+325**	**$566,165**	**+5**	**$44,297**	**+1**	**$4,240,827**	**+42**

All regional and the US totals and percent changes are based on states supplying data for both years.

a Excludes routine maintenance work *b* April '57-March '58 *c* July '57-June '58 *d* Arkansas General Assembly belatedly approved $164.5 million for highway department budget; highway department then programed $9.3 million in work and awarded $3.7 million of contracts *e* Fiscal year *f* Includes some contract work *g* Highway Commission being reorganized; budget not available *n.a.*=Not available.



80,000-lb. Beam Supported at 14-15 ft. Heights

Pour Time Cut 20% with Safway Shores

Make Jobs Easy to Figure!

Safway shores made this job easy to figure. After calculating the live and dead load and the strength of his ledgers, the job superintendent worked out the number of shores needed from the simple table below. And if you want help of any kind, your local Safway man is always ready to work with you!

SHORE HEIGHT (ft.)	SAFE LOAD CAPACITIES *including a safety factor of 3:1*		
	Models S-18 and S-114 (lbs.)	Models S-28 and S-214 (lbs.)	Models S-38 and S-314 (lbs.)
6	9910	...	...
7	9910	...	...
8	9000	9000	...
9	6200	6200	...
10	5250	5250	...
11	4550	4550	4550
12	...	3200	3800
13	...	2900	3100
14	...	...	2000
15	...	...	1500

Models S-18, S-28 and S-38 have 8-in. U-head. Models S-114, S-214 and S-314 have 14-in. U-head.

USED FASTER AND EASIER THAN WOOD SHORES AND JACKS; SET-UP AND STRIPPING TIME MINIMIZED

CUTTING COSTS can make the difference between job profit and loss, says Contractor S. M. Byrne of Milwaukee, Wis. And on his St. Theresa's Church job (*shown above*), Safway telescoping steel shores helped him assure a profit by reducing overall concrete pour time by 20%.

The 50-ft. long beam is 32 in. wide, with a depth ranging from 2 ft. at the center to 3 ft. at each end. Its 80,000 lb. weight is distributed at an average of 1,500 lbs. per shore—well within the capacity of Safway shores at the 14 to 15 ft. extensions required. Shores are spaced on 2 ft. centers and have only one horizontal wood brace.

"Our men like Safway's easy handling and quick height adjustment," asserts Mr. Byrne. "Erection and stripping time are minimized, and bracing is almost eliminated. We now own 200 Safway shores, and work 20% faster than when we used wood 4 x 4 shores and jacks."

SAFWAY SERVICE CAN HELP YOU

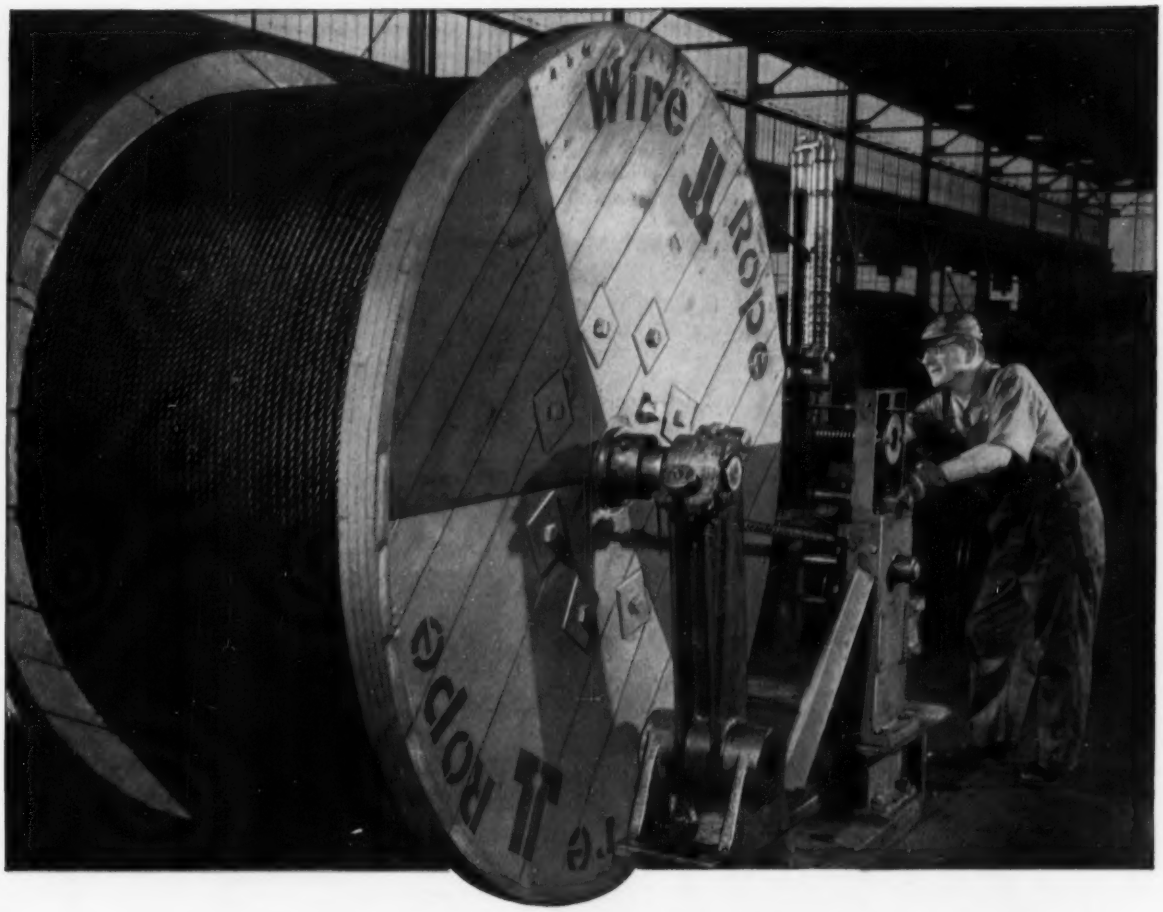
Safway's broad experience and Safway equipment can help you on every shoring problem. The Safway dealer in your area offers planning and erection service—with ample stocks for *sale* or *rental*. Get Safway recommendations on your next job.

Write FOR FREE BULLETIN

Learn all about Safway telescoping steel shores and the many advantages they offer you. Write today for your copy of BULLETIN 25.

Look for your local Safway office in the yellow pages of your phone book under: "Scaffolding." Safway has 135 warehouses to serve you.

SAFWAY
STEEL PRODUCTS, INC.
6243 W. State St., Milwaukee 13, Wis.



J & L CENTERFIT WIRE ROPE

toughest combination of strength and flexibility ever designed

On jobs where shock, severe bending and extreme loading are a problem, CenterFit wire rope gives you extra service life.

CenterFit is your best wire rope for back hoe pull ropes, shovel hoist ropes and clamshell holding and closing lines where overloading may occur. Here's why:

- CenterFit is the strongest standard wire rope produced
- More external and internal bearing surface
- Greater flexibility
- Extra metallic area of the cross section with more equal stress distribution among the strands.

CenterFit's longer service life means less down time, lower operating costs. Send coupon today for complete information.

Jones & Laughlin Steel Corporation
Wire Rope Division
Muncy, Pennsylvania

☐ Please send literature on CENTERFIT wire rope.
☐ Have representative call.

Name_____

Title_____

Company_____

City_____ Zone ____ State ____

J&L STEEL

Jones & Laughlin

...a great name in steel

CONSTRUCTION BUSINESS . . . continued

$122.3 million. The Illinois State Toll Highway Commission plans to let $100 million worth of contracts this year, four times the value of contracts let in 1956 when it first started to award sections of its $400-million-plus toll project.

Toll road contracts will be much smaller in other states. The Connecticut State Highway Department reports it has budgeted $6 million for 1957 compared with $168 million last year. The New Jersey Highway Authority figures to award $2 million this year as against $12 million in 1956. And the Washington Toll Bridge Authority has budgeted $6.6 million this year compared with last year's $10.1 million in awards.

Contract Maintenance Up

On top of the record volume of free highway construction and the large, if reduced, volume of toll project contracts, contractors can also count on a big rise in contract maintenance on the free system. This type of work will mean $44 million or more in new contractor business this year.

States to Increase Machinery Purchases

State highway departments have budgeted $55 million for buying new construction and maintenance machinery this year. This is 5% more than they spent last year.

More than half of these expenditures will be by states in two regions. Led by Texas, whose $4 million is the biggest new machin-

Continued on page 64

ROCKFORD

MULTIPLE CLUTCH SPRINGS

ASSURE EVEN PRESSURE

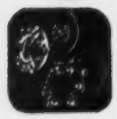
As many as 24 best quality springs are used in ROCKFORD Spring-Loaded CLUTCHES—to assure even pressure all around the plate. Made of heat-resistant wire (that will not take a "set") the springs provide long service life in today's high-speed engine driven vehicles.

SEND FOR THIS HANDY BULLETIN
Gives dimensions, capacity tables and complete specifications. Suggests typical applications.

ROCKFORD Clutch Division BORG-WARNER

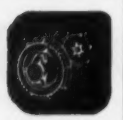
1331 Eighteenth Ave., Rockford, Ill., U.S.A.

Export Sales Borg-Warner International — 36 So. Wabash, Chicago 3, Ill.


Small Spring Loaded

Heavy Duty Spring Loaded

Oil or Dry Multiple Disc


Heavy Duty Over Center

Power Take-Offs

Speed Reducers

CLUTCHES

Equipment Purchases

Reported by State Highway Departments (in thousands of dollars)

STATE AND REGION	NEW EQUIPMENT PURCHASES 1957	1956	Percent Change
Maine	$220	$650	−66
New Hampshire	300	250	+20
Vermont	150	150	0
Massachusetts	1,334	996	+34
Rhode Island	110	90	+22
Connecticut	1,200	1,300	−8
NEW ENGLAND	**3,314**	**3,436**	**−4**
New York	2,500b	1,748a	+43
New Jersey	n.a.	n.a.	....
Pennsylvania	3,900	3,737	+4
Maryland	941c	479a	+96
District of Columbia	230	140	+64
Delaware	400	310	+29
MIDDLE ATLANTIC	**7,971**	**6,414**	**+24**
Virginia	1,500	1,085	+38
West Virginia	1,500	1,620	−7
North Carolina	n.a.	n.a.	....
South Carolina	500	500	0
Georgia	1,000	960	+4
Florida	850	750	+13
Alabama	2,000	3,992	−50
Mississippi	995	845	+18
Louisiana	2,000	1,500	+33
Kentucky	2,500	2,500	0
Tennessee	850	1,000	−15
SOUTHERN	**13,695**	**14,752**	**−7**
Ohio	1,600	1,513	+6
Indiana	1,500	1,250	+20
Illinois	2,500	1,511	+65
Wisconsin	0	0	....
Michigan	1,262	850	+48
MIDDLE WEST	**6,862**	**5,124**	**+34**
Minnesota	1,000	1,092	−8
Iowa	1,580	1,381	+14
Missouri	2,500	2,252	+11
Arkansas	n.a.	1,144	....
North Dakota	250	218	+15
South Dakota	400	627	−36
Nebraska	650	603	+8
Kansas	950	1,072	−11
Oklahoma	750	1,016	−26
Texas	4,000	3,841	+4
Montana	500	597	−16
Wyoming	300	338	−11
Colorado	950	800	+19
New Mexico	500	381	+31
WEST OF THE MISSISSIPPI	**14,330**	**14,218**	**+1**
Idaho	700	560	+25
Utah	1,000a	935d	+8
Arizona	615e	500e	+23
Nevada	500	706	−29
Washington	1,500	1,500	0
Oregon	1,200	980	+22
California	3,000	3,000	0
FAR WEST	**8,515**	**8,171**	**+4**
UNITED STATES	**$54,687**	**$52,115**	**+5**

All regional and the US totals and percent changes are based on states supplying data for both years.

a July '57-June '58 b April '57-March '58
c April '56-March '57 d July '56-June '57
e Fiscal year

now, in contractor tools, too,

if it's Remington, it's right!

12 outstanding features make the TG4 the most efficient power trowel ever designed!

These twelve features make the Remington TG4 Power Trowel by Mall the most advanced on the market. Hundreds of contractors already know it as the finest performing, easiest to handle, most versatile gasoline driven troweling machine they have ever used. Here are the twelve features. Compare them with other makes!

1. **Powerful 4-cycle, air cooled, 2½ hp. gasoline engine for fast, steady finishing.**
2. **Direct gear transmission delivers 97% of power to blade. No slipping belts to steal valuable power and reduce efficiency.**
3. **Lifting eye for raising or lowering machine from floor to floor.**
4. **Automatic recoil starter—fast, easy—no lost rope, no waste of time.**
5. **Exclusive! Quick-kick pitch adjustment ring. All three blades adjust at once. No bending—just a kick of the foot does it!**
6. **Low center of gravity design for easy operation.**
7. **Centrifugal clutch—engine disengages at idling speed. Promptly engages as engine speed increases.**
8. **Reversible shoes and blades of high-grade steel. Both edges can be used, giving double wear!**
9. **Extra strong ⅛" diameter, solid ring in 26" and 36" sizes.**
10. **Clamp ring for switching to a replacement engine in seconds. No belts, nuts or bolts to bother with!**
11. **Safety throttle control. Release handle and ring stops, engine idles. No stalling—no restarting necessary.**
12. **Floating disc attachment to smooth dry tamp floors (minimum water content) and grinding-grouting head to dry grind or wet grout concrete floors can be quickly and easily mounted in blade arm sockets.**

Only the Remington TG4 by Mall has all these advanced, time-saving features! And the TG4 is built with the quality and precision that have made Remington famous for 141 years in sporting firearms and ammunition.

For full information about the complete Remington line of Mall contractor and industrial tools, including concrete vibrators, earth augers, circular saws and many others, just send the convenient coupon.

Remington

Mall®

MALL TOOL COMPANY
Division of Remington Arms Company, Inc.
25000 S. Western Ave., Park Forest, Illinois.

Mall Tool Company,
Division of Remington Arms Company, Inc., Dept. E32
25000 S. Western Ave., Park Forest, Illinois

Please send free catalog on contractor and industrial tools.

NAME_____

COMPANY_____

ADDRESS_____

CITY_____ ZONE_____ STATE_____

Architect: Morris Lapidus, New York, N. Y. Gen. Contractor: Taylor Construction Co., Miami, Fla. Plastering Contractor: Thompson Plastering Co., Miami, Fla. Owned & Operated by Tisch Hotels, Inc.

The dramatic new **AMERICANA HOTEL**, Bal Harbor, Miami Beach, Fla., is the latest in vacationland luxury. A cosmopolitan city within itself, this $17 million hostelry features the finest in spacious living.

Contributing to the structural quality of this hotel is **LEHIGH MORTAR CEMENT.** It was used in the masonry walls which required over 100,000 concrete blocks—and in the exterior stucco.

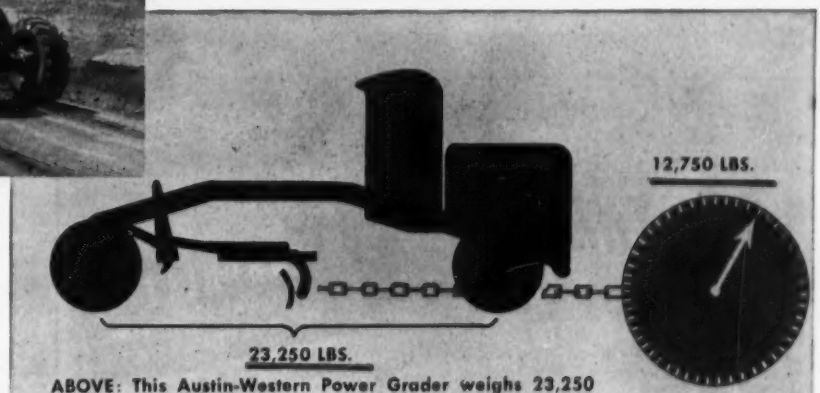
LEHIGH PORTLAND CEMENT COMPANY ALLENTOWN, PA.

Not "How Big?" But "How Good?"

The ability of any motor grader to do hard cutting, and move big blade loads of material in the lower gears, where heavy work is done, depends entirely upon the amount of weight carried on *driving wheels*. Total weight has nothing to do with it.

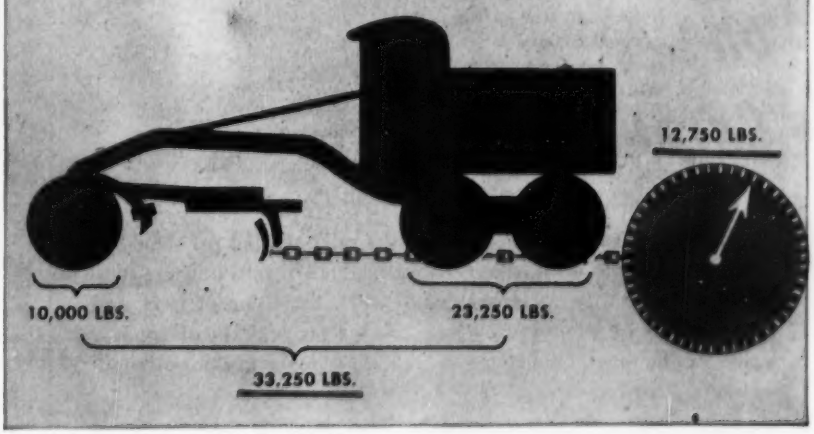
Most for Your Money

From every standpoint . . . first cost, operating cost and upkeep . . . the A-W Power Grader gives you more for your money . . . moves 30 percent more material than an ordinary grader of equal weight and horsepower; and as much material as heavier, more expensive graders . . . as explained in the diagrams at the right.



ABOVE: This Austin-Western Power Grader weighs 23,250 lbs.—all carried on driving wheels. Working in average dirt, it has a blade pull of 12,750 lbs.

BELOW: To obtain the same blade pull, an ordinary motor grader would have to carry 23,250 lbs. on its *rear drivers*; PLUS about 10,000 lbs. on its *dead front end*, for a total of 33,250 lbs.



SIZE IS NOT THE MEASURE OF MOTOR GRADER PERFORMANCE

There's more to the story. All-Wheel Steer makes the machine twice as maneuverable as graders with front steer only; while the Controlled Traction made possible by the teamwork of All-Wheel Drive and All-Wheel Steer moves more material . . . moves it farther . . . moves it faster. Your nearby Austin-Western distributor will be glad to tell you the whole story of "The Power Graders That Have Everything."

Power Graders • Motor Sweepers • Road Rollers • Hydraulic Cranes

AUSTIN-WESTERN WORKS
BALDWIN-LIMA-HAMILTON
Construction Equipment Division
OTHER DIVISIONS: Eddystone • Lima • Electronics & Instrumentation • Hamilton • Loewy-Hydropress • Standard Steel Works • Madsen • Pelton
AURORA, ILLINOIS, U.S.A.

CONSTRUCTION BUSINESS . . .
continued from page 60

ery budget of any state, states in the West of the Mississippi region plan to buy $14.3 million worth of machines this year.

Most States on Schedule

Interstate highway construction programs are on schedule in 32 states and the District of Columbia. Of the 12 states whose programs are reported not on schedule, seven are located in the region west of the Mississippi and east of the Rockies.

Shortages of highway engineering personnel and problems in right-of-way acquisition are most commonly mentioned bottlenecks. But more often than not, these two bottlenecks are not holding up schedules. For instance, six of the 12 states with lagging programs blame the highway engineer shortage; but 13 other states with the same problem say it isn't throwing their programs off schedule. And while right-of-way acquisition is slowing down construction programs in five states, eight other states facing the same difficulty are keeping their programs on schedule.

The materials supply outlook is good. None of the states reports a cement bottleneck, and only six states point to a steel shortage.

Bottlenecks Affecting Interstate Programs

Programs Not On Schedule in . . .	. . . Because of these bottlenecks
New England—	
Vermont	ROW; Engineers
Middle Atlantic—	
Delaware	None mentioned
South—	
Virginia	Engineers
South Carolina	ROW; Engineers
Middle West—	
Indiana	Engineers
Michigan	None mentioned
West of Mississippi—	
Minnesota	ROW; Engineers
Iowa	Steel
South Dakota	ROW
Nebraska	None mentioned
Kansas	Engineers
Oklahoma	ROW; Engineers; & steel

First Quarter Highway Bid Prices Up 1.4%

Contractors increased their bid prices on new federal-aid highway projects let in the first quarter by an average of 1.4% above the fourth quarter of 1956. This is the largest first quarter increase since 1951, as measured by the U S Bureau of Public Roads Composite Mile Bid Price Index.

The first quarter Index hit a new all-time high of 169.7, based on average 1925-29 prices.

Though this is 7.7% higher than the first quarter of '56, it is up only 1.5% since the new Interstate Highway Program got underway last July.

Rugged competition for the record volume of new highway work has helped keep the price rise to a minimum—though steel and cement prices have increased during the last nine months. The fact that with such large volumes of work contractors can keep their crews and machines operating at a steady pace has helped them hold down the price rise.

The effects of higher cement, steel, and labor costs on bid prices are obvious from the increase in BPR's first quarter subindexes for these bid items: concrete pavement, up 0.5%; reinforcing steel, 3.7%; structural concrete, 3.5%; and common excavation, 1.5%.

Contracts Awarded on page 322

Get This NEW 24-Page Booklet on Carpullers!

It shows at a glance, how to compute the cable tension per thousand pounds of load, at level or on various inclines. It tells how much to allow for weight of car, curvature of track, condition of track and low temperature conditions. It suggests the proper type of rope or cable for different jobs, and gives a table showing the working strength of each, according to diameter.

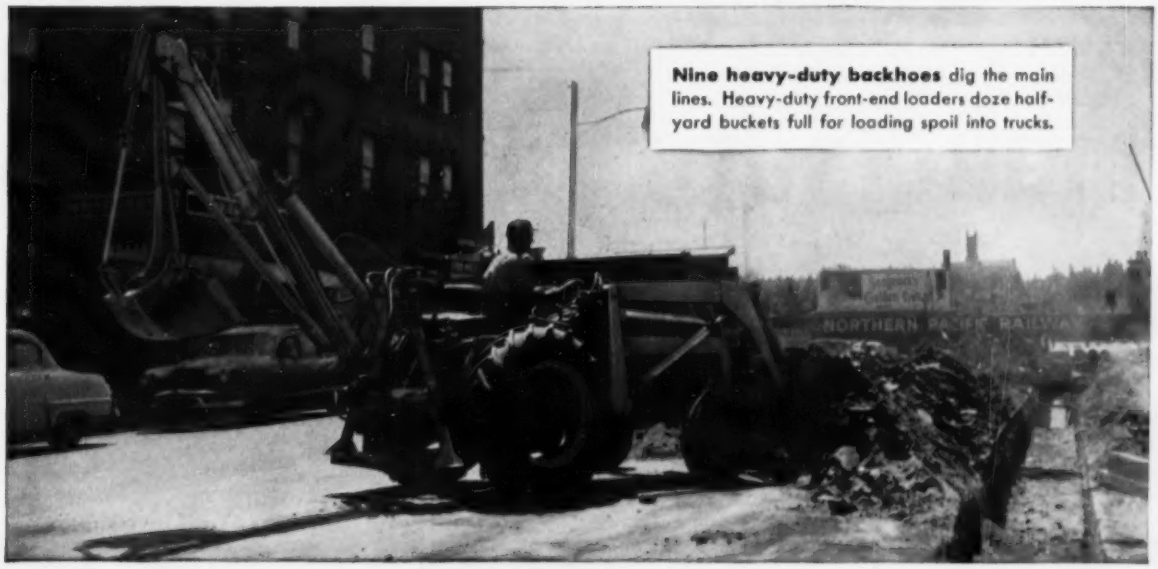
LATEST MODELS—WITH LAYOUTS—Contains over 30 models of regular and special types of carpullers and barge moving winches, including information on dimensions, weight, horsepower, work capacity, rope capacity etc., with diagrams of most efficient layouts for various models.

WRITE ON YOUR LETTERHEAD FOR BULLETIN C-616

Superior–Lidgerwood–Mundy Corporation

MAIN OFFICE AND WORKS—SUPERIOR, WISCONSIN

NEW YORK OFFICE—7 Dey St., New York 7, N. Y.



Nine heavy-duty backhoes dig the main lines. Heavy-duty front-end loaders doze half-yard buckets full for loading spoil into trucks.

700 miles of gas line trenching

...dug with 14 International® Utility tractors

Four rear-mounted trenchers dig the lateral lines. There's a crawl speed to match any digging job . . . variable from 0 to 600 feet per hour at the touch of a lever.

Natural gas for the Pacific Northwest! Over 700 miles of main and lateral gas lines will soon give city-wide distribution for Spokane, Washington. All trenching is being done with rugged, work-eating International 300 Utility tractors . . . chosen for exclusive use on this job by Hall-Mac Construction Co., Houston, Texas.

Up to 1,000 pounds greater built-in weight in this rugged utility tractor gives greater backhoe pressure for faster digging . . . traction for bigger loader bites.

Work-speeding options also cut costs. *Integral power steering* saves time and effort in turning and loading. *Time-saving Torque Amplifier* boosts push or pull power up to 45 per cent . . . on the go, gives 2 speeds in each gear.

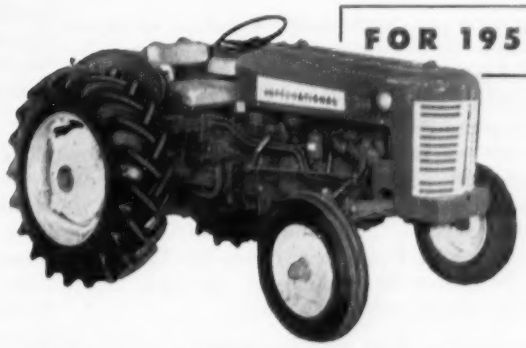
There are 5,000 IH dealers for prompt sales-service *wherever* your job is located! Your IH dealer will demonstrate. Look in the classified . . . call today!

See your

INTERNATIONAL HARVESTER DEALER

International Harvester products pay for themselves in use—McCormick Farm Equipment, Farmall and International Tractors . . . Motor Trucks . . . Construction Equipment—General Office, Chicago 1, Illinois.

FOR 1957



...the new, still more powerful INTERNATIONAL 350 UTILITY

Response like you've never known! Feel the smooth, new power of the engine. See the new, even more rugged, extra-heavy-duty front axle. Add these to many other time-tested features . . . the new International 350 Utility gives greater cost-cutting capacity than ever. Choose gasoline, LP Gas, or diesel engine.

Before you invest in make sure you get king—

Make sure you don't wear blinders when you invest in king-sized crawler power!
Make sure every dollar you invest buys the top pay-off power features. Look to the International TD-24 for the most profitable king-sized crawler performance your money can buy!

Make sure you don't dissipate dollars on a king-sized machine with load-limiting, "dead-track drag"!
The useful load of any king-sized, steering-clutch crawler is limited to what it can pull or push on turns. "Dead-track drag" hogs horsepower!

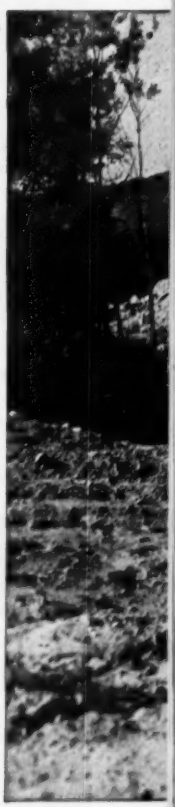
Exclusive and years-proved Planet Power steering gives the TD-24 full-time live power on both tracks. Upgrade or down, the TD-24 pulls or pushes its big loads on the turns or straight ahead, *with both tracks!*

Make sure you don't drop big money in high-priced time losses with "service-nervous" engine clutch complications!
The TD-24 gives you the operating ease, power-transfer efficiency, temperature-immunity, and service economy and simplicity of the International Cerametallic-faced engine clutch. And heat-defiant, long-lasting Cerametallic facings have amazing resistance to wear!

In your king-sized tractor, make sure you get your big money's worth—by getting the cycle-speeding advantages of TD-24 on-the-go shifting!
And compare how the TD-24's exclusive two-speed planetary system gives instant, stall-preventing Hi-Lo shifting without declutching in either the Torque-Converter or Gear-Drive models. You also get the added advantage of "no-stop" shifting with exclusive synchromesh transmission in the Gear-Drive model.

Make sure you don't fizzle away big finances by handicapping your operator—give him a break!
Give him TD-24 flush-deck design, control-tower vision, and reach-easy finger-tip controls to increase operator comfort and performance. Give him "one-engine" simplicity for seconds-fast starting and dependable diesel operation. Give him ALL of the dozens of other king-sized production-boosting TD-24 advantages!

Make sure you invest wisely and get full dollar value in giant-sized performance. See your International Construction Equipment Distributor for a TD-24 demonstration!



a king-sized crawler -sized performance!

With the TD-24 Torque Converter model as pusher, four International 75 Payscraper units prove able to outperform a fleet of six competitive self-propelled scrapers! Contractor, Terra Construction Co., Great Bend, Kansas, is handling a 500,000 cu yd grading job on Kansas 15, near the Nebraska line. "Perfect performance from all our International equipment," states Job Superintendent Weller.

"Where our other tractors failed this TD-24 has the stuff to get the job done," reports Mike Cashen, for Cashen and Erickson, Hibbing, Minnesota. "It is fast, easy to maneuver, and the only tractor we found that could load in these rocks." The job is building a tailings settling pond at a new Taconite plant in the Mesabi Iron Range. Because it's tough, the TD-24 wins the job of push-loading three self-propelled scrapers, and 'dozing boulders aside!

INTERNATIONAL® CONSTRUCTION EQUIPMENT

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

"65" PAYHAULER® hauls

4-ton rocks and ⅔-mile haul involved in Oregon road straightening job!

The wet, sticky clay in these pictures will give you an idea of the working conditions encountered by the "65" Payhauler operated by the Funderburk Construction Co., Sutherlin, Ore., on their 2-mile road job near Elkton. This clay cut machine efficiency on the job as much as an estimated 50%. Truck bodies had to be scraped clean periodically. And a bogged-down 1½-yd shovel had to be replaced by a sure-treading 3-yd International Drott TD-18 Skid-Shovel®.

In spite of these rough working conditions...and in spite of big 4-ton blocks of rock found in the clay...the International "65" Payhauler still maintained an average of 96 yds per hour on the ⅔-mile haul to the fill.

Veteran earthmover and Payhauler operator, Aaron Johnson, stated, "Here is the poorest loading material I've ever seen. Still I'm getting six 16-yard loads each hour over a cycle distance of 1⅓ miles."

Don't let unexpected weather and resultant job-bogging clay, mud, or water hold up your off-highway hauling jobs. Consider these all-weather, all-condition Payhauler advantages: proper weight distribution with 71% of total load on "95" drive wheels...74% of total load on "65" drive wheels; ample power from turbo-charged diesel engines with built-in fuel savings up to 10%; maximum power-transfer efficiency of International's long-lasting cerametallic-faced clutch; and load-matched gear ratios for smoother, faster selection of the right gear for every grade...every road condition.

Rock, bigger than 3-yd Skid-Shovel bucket, found in wet clay cut operating efficiency. Payhauler body, fabricated from abrasion-resistant high-tensile steel, together with strongest frame in its class, stands up to tough punishment of rock loading.

INTERNATIONAL® CONSTRUCTION EQUIPMENT

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors... Self-Propelled Scrapers... Crawler and Rubber-Tired Loaders... Off-Highway Haulers... Diesel and Carbureted Engines... Motor Trucks... Farm Tractors and Equipment.

96 yds per hour

of job-bogging sticky clay!

Double-acting hoist cylinder in all stages with 106,300 pounds of force in first stage raises body in seconds. Hydraulic snubbing action prevents undue stress on hoist cylinders and "gentles" body return to frame.

International Drott TD-18 Skid-Shovel replaced 1½-yd shovel to load clay, big boulders into "65" Payhauler. "65" gives you big, bonus-producing 18-ton capacity, Model "95," 24 tons.

International trio...TD-18 Skid-Shovel, TD-24 tractor and Model "65" Payhauler promote production for Funderburk Construction Co., in spite of wet, sticky clay and big, stubborn rock.

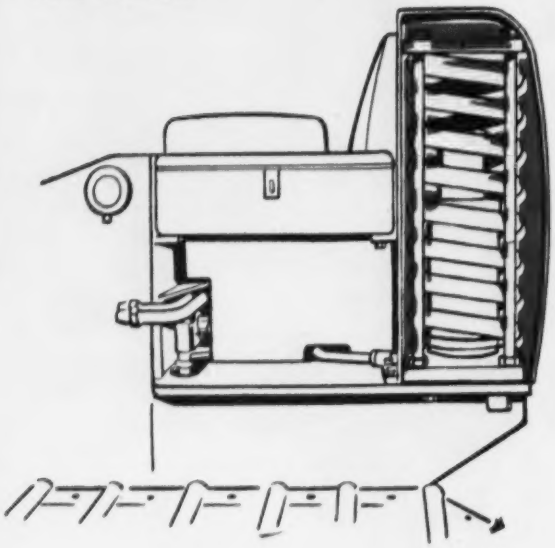
HOW CAPACITY-

. . . shock-

stops hose-bursting,

When you're semi-skidding heavy bucket-loads of material over rough terrain, and the skid-shoes contact a high spot abruptly, linkage isn't pounded—and your spine isn't mauled! *Shock-swallowing Hydro-Spring takes over. No pain—no strain!*

Exclusive Hydro-Spring reduces the effects of shock forces by an actual 67%, or more. Only International Drott gives you Hydro-Spring advantages.



How patented Hydro-Spring increases equipment life and capacity

Exclusive International Drott Hydro-Spring is a hydraulic cylinder enclosed in a heavy-duty *locomotive-type* coil spring. Shock force displaces oil from main lift cylinders into the Hydro-Spring cylinder—extending it and compressing the big spring to absorb and cushion impact loads.

Owners declare that Hydro-Spring adds a whopping 25% to loader and tractor life—besides reducing downtime and boosting production!

Try Hydro-Spring, turned on and off, to prove a vital money-making difference between International Drott and unprotected front-end loaders! Measure the job-getting, yard-adding advantages of exclusive triple-power, pry-action break-out and other International Drott exclusives. And see how you can beat a fleet of limited-duty rigs with an *exclusive* Four-In-One. See your International Drott Construction Equipment Distributor for a demonstration.

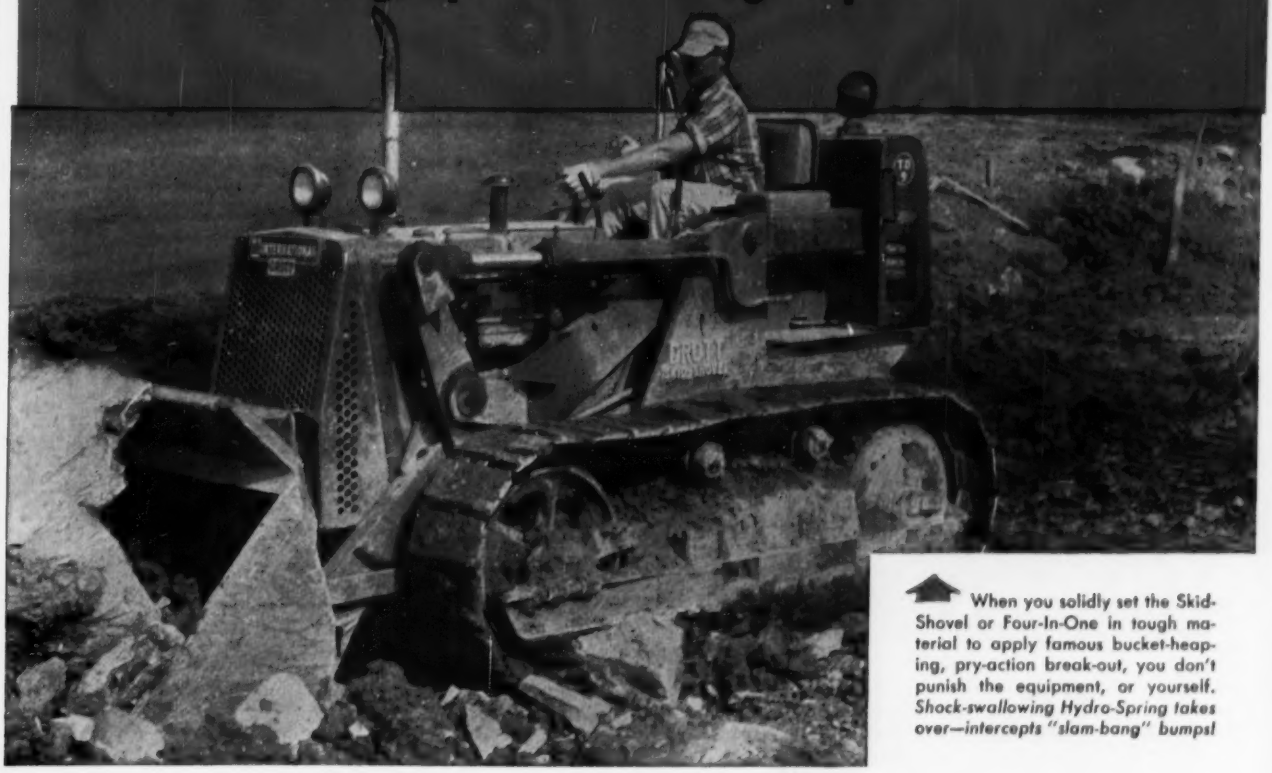
International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

INTERNATIONAL® DROTT

ADDING,

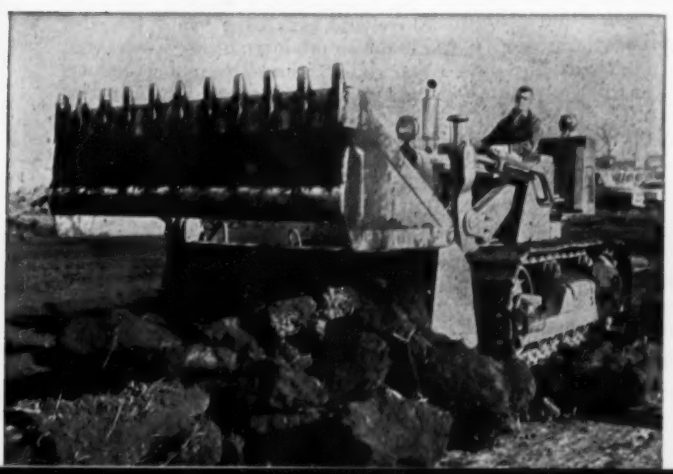
swallowing Hydro-Spring

frame-mauling, spine-smacking impact!



When you solidly set the Skid-Shovel or Four-In-One in tough material to apply famous bucket-heaping, pry-action break-out, you don't punish the equipment, or yourself. *Shock-swallowing Hydro-Spring takes over—intercepts "slam-bang" bumps!*

When you're using the Four-In-One in dozer position and plow into tough material like this hard-frozen soil, you don't overload hose connections with a tooth-jarring crash. *Shock-swallowing Hydro-Spring "gentles" trouble-causing forces by two-thirds, or more.*



When you dump a bucketful of rock in one sudden clatter, don't brace for a bump, or expect something to break loose. *Shock-swallowing Hydro-Spring cushions impact, thus cuts time loss, and practically eliminates hydraulic hose failures.*

B.F.Goodrich report:

Men punch holes in rock to blow up a cliff

B. F. Goodrich improvements in rubber brought extra savings

Problem: Those workmen are drilling holes for dynamite charges, to blast out rock for a dam. It's no cinch to lug a heavy drill down a cliff like that. Too many times it had to be promptly carried up again—the tool had choked to death.

When heat from the compressor got into the hose, it would harden the rubber, breaking it into loose, gummy particles that clogged the air tool, put it out of action.

What was done: B.F.Goodrich engineers went to work on the problem. By adding, subtracting, changing proportions of rubber, they found a special compound that stands hot air, won't harden, crack, or break into gummy particles to clog tools.

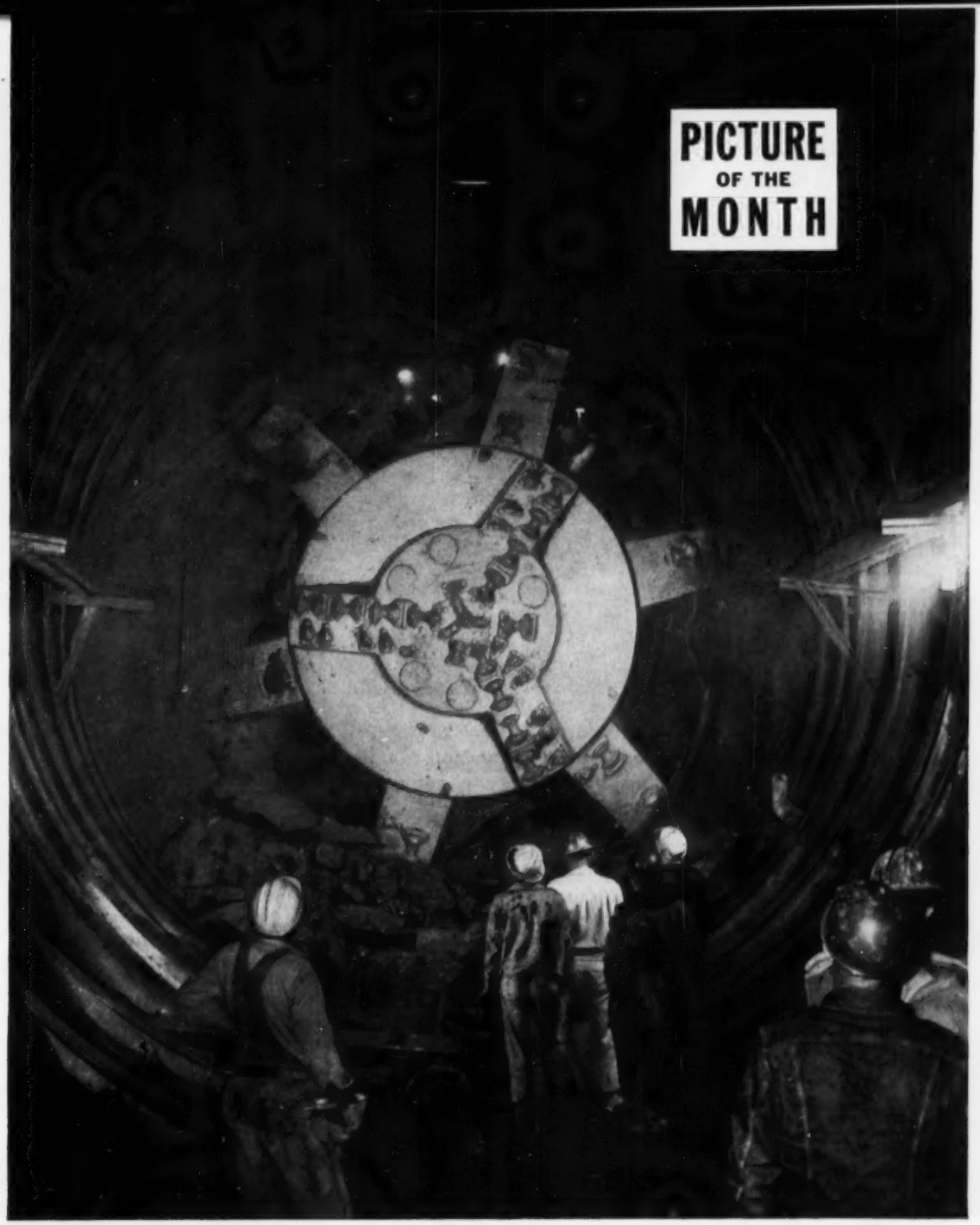
Savings: Hose lined with this new rubber was made and put to work. On jobs where air hose used to go to pieces in weeks, B.F.Goodrich hose lasts months, even years. The nuisance of clogged tools was ended permanently.

Extra benefits: Resistance to heat is only one of the improvements made in this B.F.Goodrich air hose. It has a cover so rugged that dragging over rough rock won't tear it. And it's light, flexible, easy to work with.

Where to buy: Your B.F.Goodrich distributor has exact specifications for the B.F.Goodrich air hose described here. And, as a factory-trained specialist in rubber products, he *can* answer your questions about *all* the rubber products B.F.Goodrich makes for industry. *B.F.Goodrich Industrial Products Co., Dept. M-917, Akron 18, Ohio.*

B.F.Goodrich

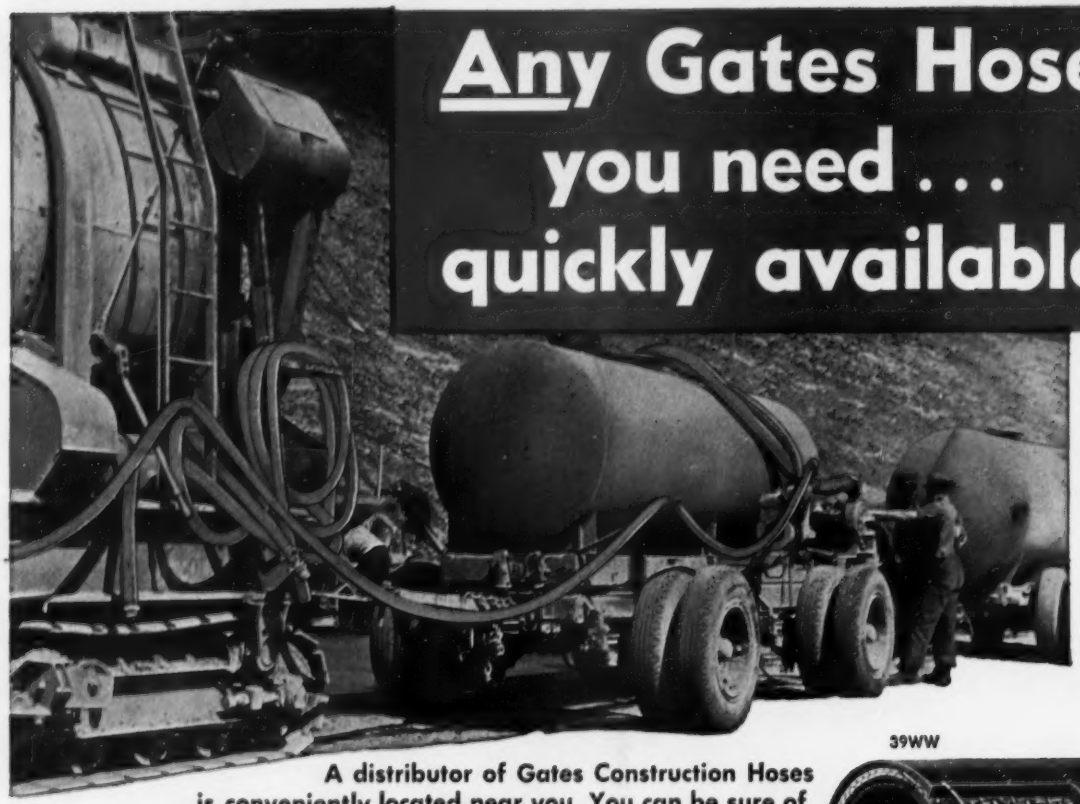
INDUSTRIAL PRODUCTS



The Mole Holes Through

• Continuous miner, called "The Mole," holes through the last of six flood control tunnels at Oahe Dam on the Missouri River. This and a twin rig have bored 21,231 ft of tunnel at Oahe during the last three years. They were designed and built for the job at a cost of $350,000 each (CM&E March, 1956, p. 78). And the investment has paid off; one of the moles has drilled as much as 140 ft of tunnel a day though average production is much less because of fallouts in the heavily faulted Pierre shale. Oahe Constructors, a combine of five firms headed by Foley Bros. of St. Paul, Minn., now are moving the moles to the opposite side of the river to dig seven power tunnels.

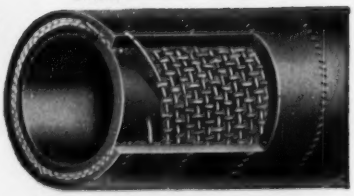
Any Gates Hose you need . . . quickly available



A distributor of Gates Construction Hoses is conveniently located near you. You can be sure of getting the *right* hose *quickly* for any construction job.

Here are three popular types:

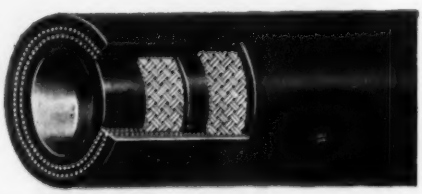
39WW



39WW Gates Water Suction Hose
Tough but flexible, this all-purpose, heavy-duty suction hose is used for the intake side of any pump requiring hose up to 4" inside diameter. (Can also be used for discharge service.) Reinforcing wires and cords are interlaced to provide a strong, well balanced construction.

500SB

500SB Gates Heavy Duty Water Suction Hose with maximum crush resistance. This heavy duty hose has rugged spring steel wire and strong fabric reinforcing to make it practically crush-proof. Tube is compounded to handle abrasive fluids such as those encountered in construction work. Recommended for use on 4", 5" and 6" centrifugal, diaphragm and piston type pumps. Made with inside diameters from 2" to 6".



35B

35B Gates General Purpose Water Hose for long life in rough service. A superior hose for all types of wet-down service . . . for concrete making . . . for discharge on small pumps. Top quality black rubber cover is built to withstand rough usage and exposure to weather—won't chip or scuff off. Tightly twisted cords provide rugged reinforcement—permit use of high water pressures. Heavy gauge tube compounded for long service. Available in long, continuous lengths—½" through 1½" inside diameters.

The Gates Rubber Company, Denver, Colorado

The Mark of *Specialized* Research

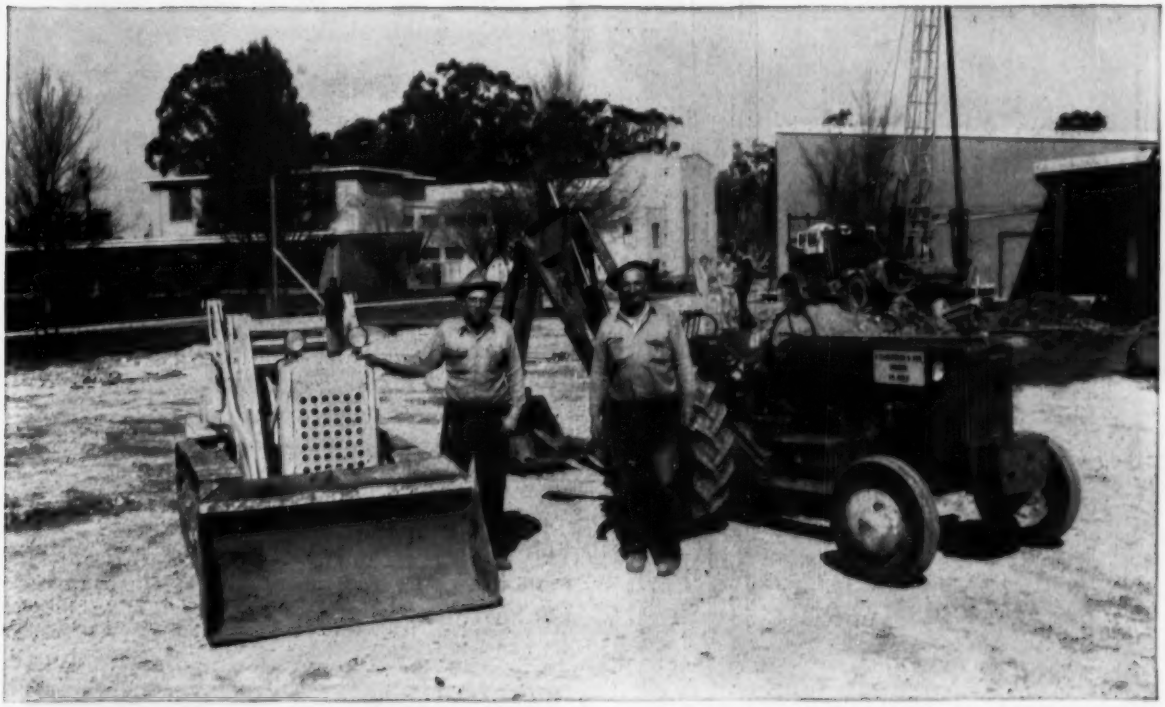
Gates

Gates Distributors are in the Yellow Pages

TPA 164

Gates Construction Hose

"We Have All the Work We Can Take Care of....."



F. T. Anderson and Son with Two of Their JOHN DEERE TRACTOR Work Units

THESE are money-making days for folks who want to be their own boss and who are properly equipped to handle general contracting work.

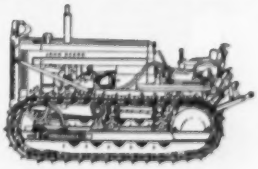
Take the F. T. Anderson and Son team of Sonoma, California, for instance. In the spring of 1955, Mr. Floyd Anderson started in the small contracting business by trading his farm machinery in on some John Deere "40" Tractors and allied working equipment. He and his son soon found that they had so much business they needed more equipment, and within a period of 8 months they had four John Deere units working in Sonoma, Napa, Marin, and Solano counties.

Mr. Anderson states: "We have all the work we can take care of. Our John Deeres are sure good tractors. They are reliable, economical to operate, and give us nothing but successful operating time. We dig everything . . . move anything. These tractors help us do the job better than any other make we could test, and better than others that we see on the job. Yes, sir, we sure are satisfied with our four John Deere units."

Take a tip from the Andersons—enjoy the fuller profits that can be yours with dependable, economical John Deere-powered equipment. Talk with your nearest John Deere industrial dealer. Look for his name in your phone book classified section.

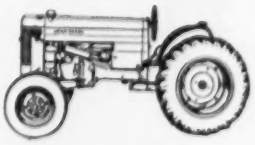
John Deere Crawler

30 h.p. high torque engine.
Highly maneuverable.
Choice of track shoes.



John Deere Utility

30 h.p. wheel-type.
Direction Reverser optional for both tractors.



JOHN DEERE
Industrial
Tractors and Equipment

Backed by nearly 40 years of tractor manufacture for dependable service and quality.

Send for FREE LITERATURE

JOHN DEERE • Industrial Division
Moline, Ill. • Dept. D19J

Please send me your latest literature on the John Deere Tractors and Equipment.

*Name*_____

*Title*_____

*Firm*_____

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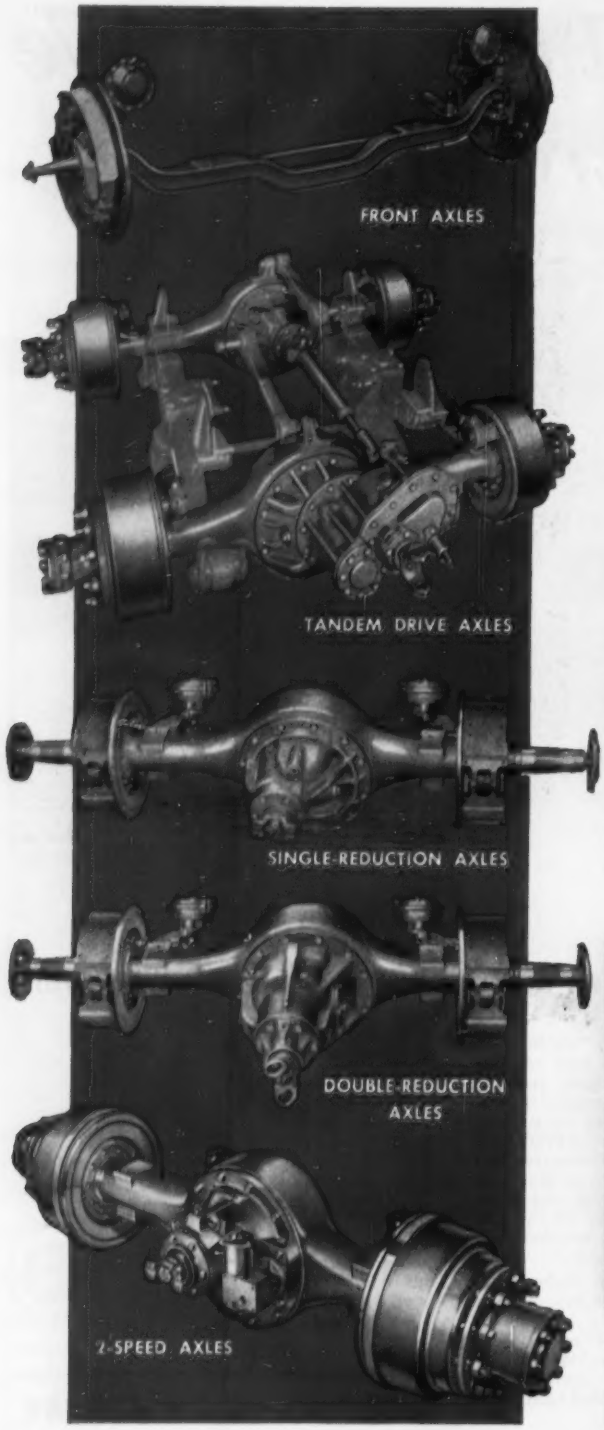
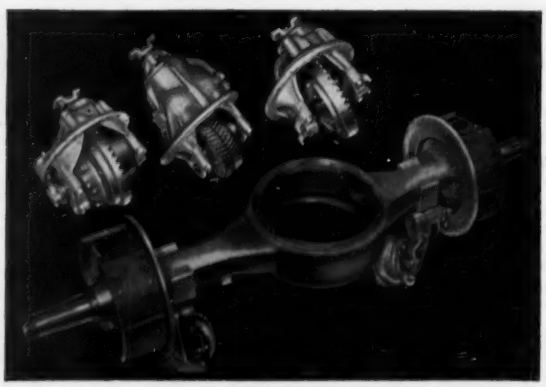
*City*_____ *State*_____



EATON AXLES

Outstanding Performance Cuts Hauling Costs, Assures Longer Vehicle Life

Strict adherence to exacting quality standards, the most modern of production procedures, and important design advancements developed through Eaton's years of axle experience, combine to offer the truck operator axles with many worthwhile benefits. Eaton Axles, engineered for rugged stamina, keep trucks on the job, hold down operating and maintenance costs, and deliver more vehicle miles at lower cost per mile.



This rugged housing, used in famous Eaton 2-Speeds, is also used for Eaton single-reduction and double-reduction axles. The three types of heads are interchangeable.

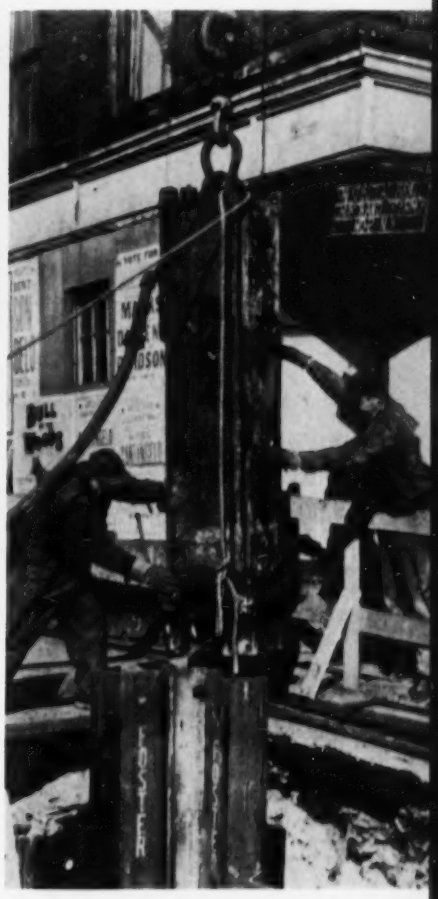
EATON — *AXLE DIVISION*
MANUFACTURING COMPANY
CLEVELAND, OHIO

PRODUCTS: Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater-Defroster Units • Snap Rings Springtites • Spring Washers • Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers

Construction News in Pictures . . .

Ahead of Schedule

Merritt-Chapman & Scott is running ahead of schedule on construction of Priest Rapids Dam on the Columbia River. Last month, M-C & S placed the first concrete for the powerhouse foundations in the area enclosed by the first stage cofferdam. The second stage cofferdam will enclose construction for the first 11 bays of the spillway. M-C & S holds a $92 million contract from the Public Utility District of Grant County, Wash.



It Takes Skill

Workmen for New York contractor Tully & Di Napoli position a McKiernan-Terry hammer for a delicate job. They must drive steel sheet piles past old steel sheeting and through heavy timbers exactly to the roof of a subway manhole without cracking it. The piles will form an open caisson for work on the subway.

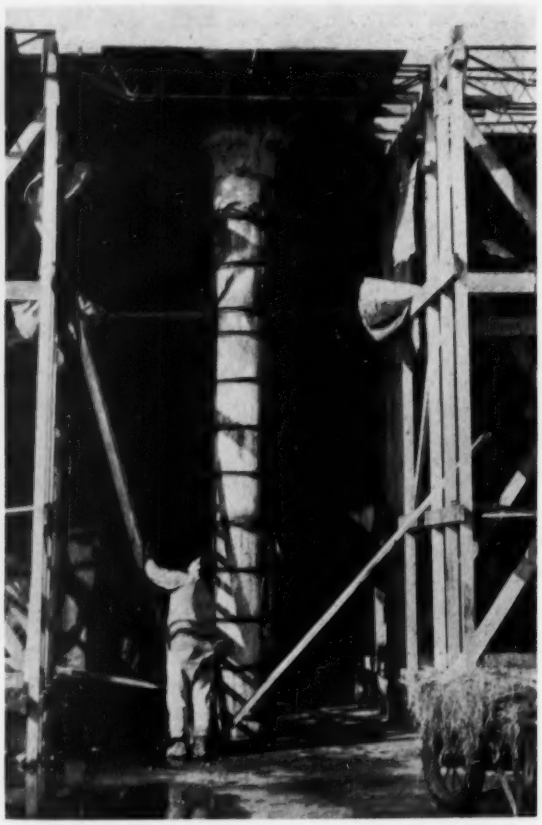
Moving Day

George T. McLean Co. of Portsmouth, Va., is moving 800 homes from a World War II housing project to a new location about a mile away. McLean's 35-ton Lorain Moto-Crane with 55 ft of boom picks up a 16-ton unit, places it on a trailer for the move, and unloads it on to the foundation at the new site 1 mi away.

continued on next page

Last Mile

This Cleveland trencher is digging the last mile of a 152-mi cable trench along the tracks of the Southern Railroad between Atlanta, Ga., and Greenville, S. C. The trench is 30 in. deep and 12 in. wide. Feeding cable into the trench right behind their digging wheels, two Cleveland trenchers dug the long trench at a rate of ¼ mi per day.



Forming Columns

Supporting the roof of the huge new Chicago filtration plant are 775 concrete columns. To form the columns, Herlihy-MidContinent Co. uses Deslauriers steel molds that are assembled in sections for columns of any height or diameter. The Central District Filtration Plant on Lake Michigan is 80% completed and will go into operation this fall.

$11-Million Bridge

Foundation for the bridge that will carry the Connecticut Turnpike across the Mianus River requires 34 cofferdams of various sizes. Poirier & McLane Corp. of New York drives L. B. Foster steel sheet piling to a maximum depth of 50 ft with a Northwest 80D crane and a Lima 802 crane, both equipped with McKiernan-Terry air hammers.

put your name on a low-cost LORAIN-107

for "BIG-JOB" PROFITS

When you are ready to buy that big shovel-crane to take advantage of the many bigger jobs in the expanding construction industry, be sure it's one that will pay off in biggest profits. Consider these facts before you buy:

Your job and profit potentials. The Lorain-107 will open the door to dozens of jobs. This low-cost machine can make money excavating, trenching, erecting steel, laying pipe, lifting, loading, unloading—uses are almost unlimited. Even on big contracts there are lots of "odd jobs" the economical "107" can handle profitably instead of tying up bigger equipment. And because the "107" is a mobile, high-speed, rubber-tire machine, it will go quickly anywhere under its own power—you drive it yourself—save trailer transport costs.

What your name on a Lorain means. Let's look at the Lorain-107 as an investment—for profit! In the Lorain line, the "107" is the smallest machine we make—but that's good because you get the benefit of many Lorain "big-machine" design features. Here are a few—easy-acting hydraulic power control of 5 interchangeable clutches; generous use of anti-friction bearings; sturdy, rigid, box-section turntable bed; 2-position turntable mounting plate for most effective digging or lifting service; machine-cut spur gears; precision boom lowering device; hydraulic boom hoist brake; choice of two carriers—"6x4" or "6x6"—every detail adds up to the biggest value in a 7 or 8-ton machine. Chances are, your name on a bright yellow Lorain-107 will bring new business your way. Your customers will know you use the best.

Now—call your Thew-Lorain Distributor for proof!

SEND FOR NEW LORAIN-107 CATALOG

7 or 8-ton Crane
⅜-yd. Shovel, Hoe
Dragline, Clamshell

"107" JOB USES ARE UNLIMITED — WITH 5 INTERCHANGEABLE FRONT ENDS AVAILABLE.

THE THEW SHOVEL CO., LORAIN, OHIO

THEW LORAIN®

HERE'S LOADER MOBILITY . . . EXCAVATING STRENGTH

LOADS 1½ CU YD AT A PASS . . . 2¼ yd with light materials bucket. Lifts up to 11,200 lb.

WORKS RIGHT UP ON A STOCKPILE where wheels dig in. Can build stockpiles higher, store many more yards of material in a given area.

TURNS IN ITS TRACKS . . . where many smaller loaders have to jockey.

DIGS INTO HARD-PACKED MATERIAL . . . exerts 20,000-lb break-out force, with 72 net engine hp and modern bucket design.

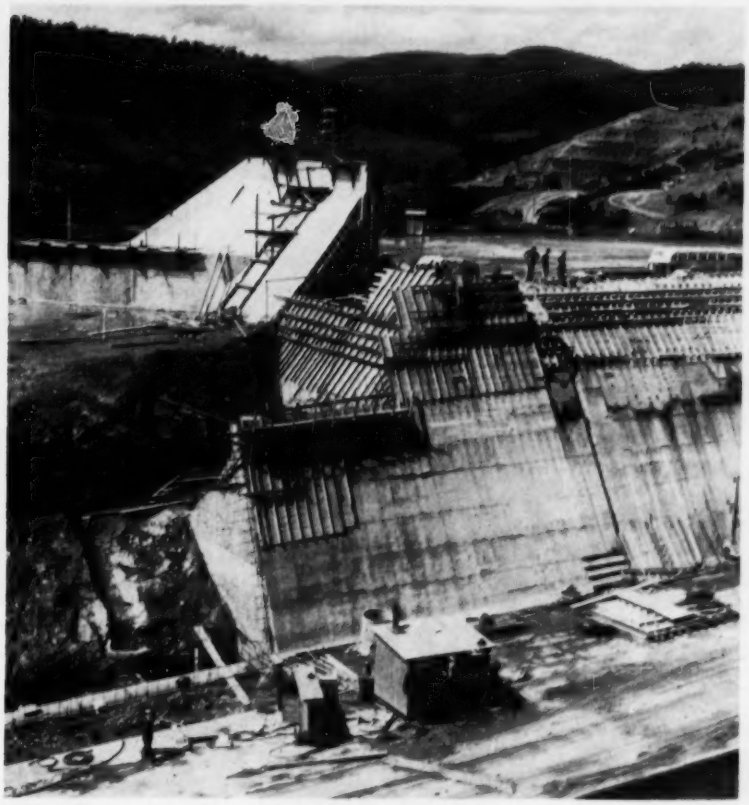
These are just four examples of how an Allis-Chalmers HD-6G tractor shovel offers a combination of strength, traction, flotation and mobility that enables it to replace a fleet of part-time specialized machines. You can count on it to boost production the year round. Ask your Allis-Chalmers dealer about the HD-6G . . . also the three larger tractor shovels with capacities up to 4 cu yd. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS *Engineering in Action*

Construction 'Round the World

In Guatemala

Contractor Nello L. Teer Co. pushes a $7.2-million, 40-kilometer section of the 185-mi Atlantic Highway through mountainous terrain between Agua Caliente and El Rancho. Highway will connect Guatemala City with the two Atlantic ports of Barrios and Santo Tomas and with the Pacific port of San Jose.

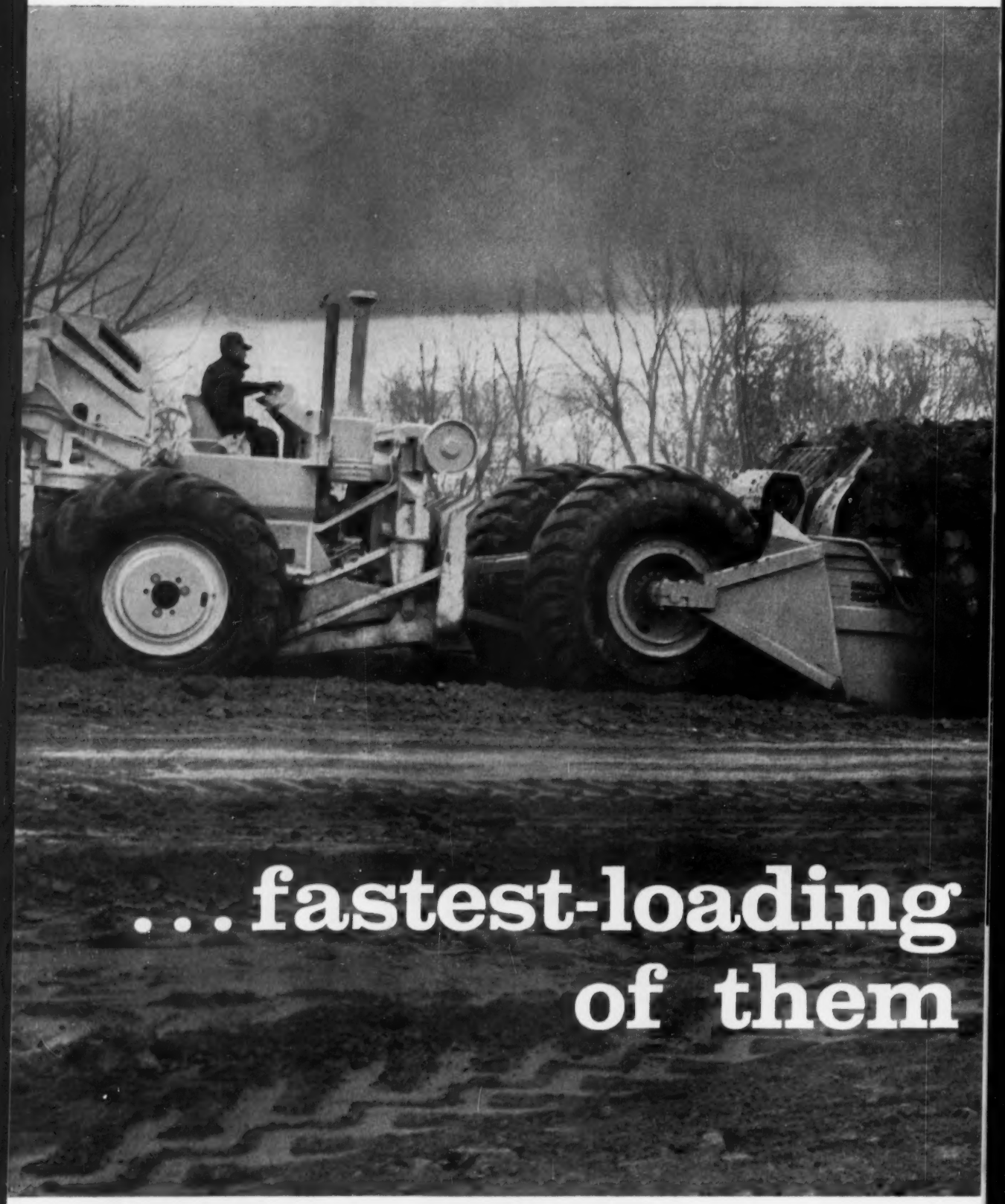


In Australia

Upper Yara Dam in Victoria races towards completion. Here the spillway weir is shown under construction. Embankments will be 293 ft high, 2,000 ft long, and have a width of 1,600 ft at the base and 30 ft at the top. When full, the reservoir will cover an area of 1,965 acres of which 60% already is cleared.

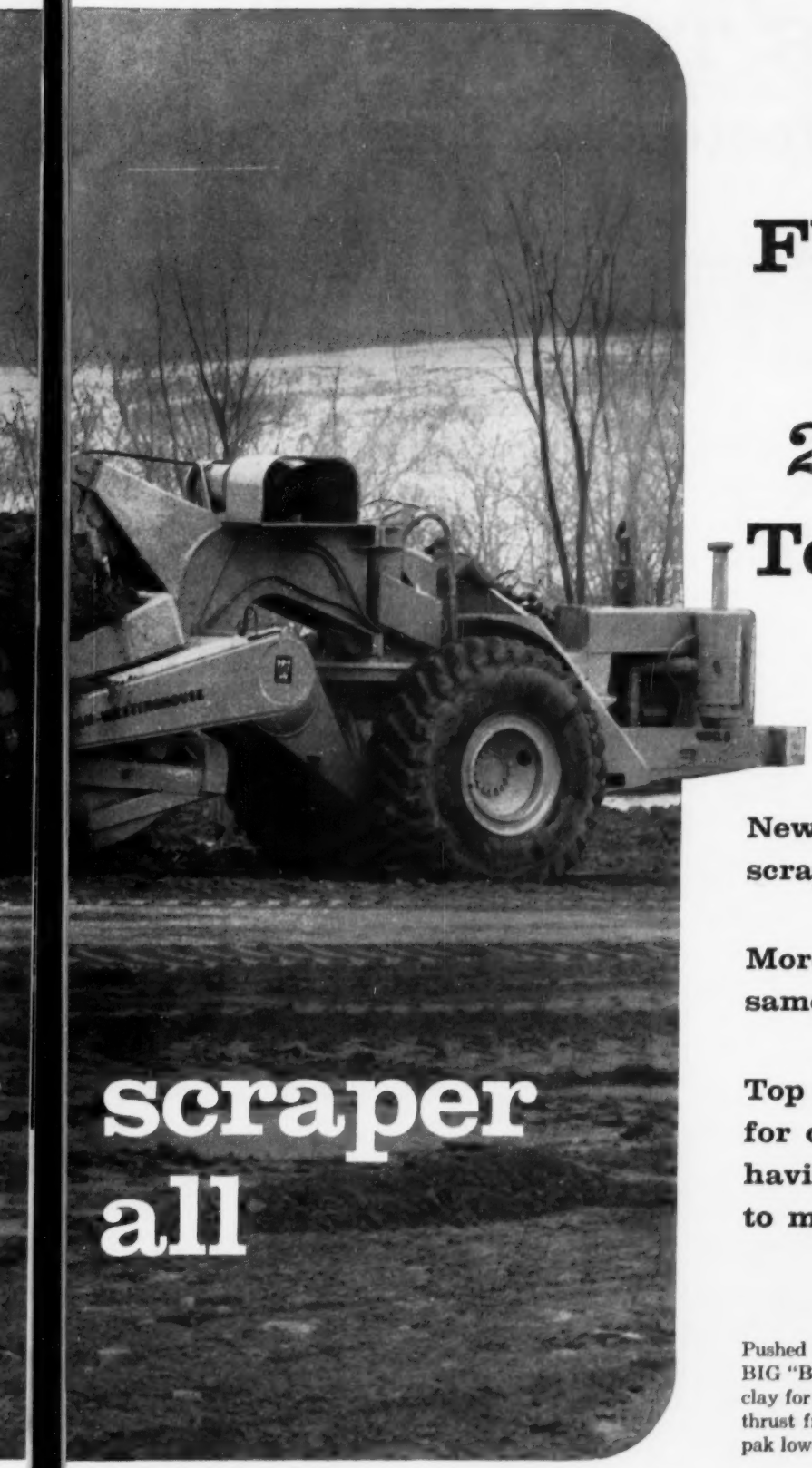
In Canada

The tallest material handling towers ever used in Western Canada are at work on the new British Columbia Electric Building in Vancouver, B.C., lifting everything from steel and concrete to form work and plaster. Towers stand 365 ft high. They were made by American Tubular Elevator Company of Zelienople, Pa.



. . . fastest-loading of them

advertisement



scraper all

...the new 27-yard FULLPAK*

with new 293 hp B Tournapull®

New low-and-wide scraper design

More pay-yards with same pusher-power

Top money-maker for contractors having big yardages to move in a hurry

Pushed by 420 hp Twin-C* tractor, the BIG "B" bites into half-frozen, hard-packed clay for a heaped capacity load. Direct-line thrust from pusher to cutting edge of Full-pak low-and-wide bowl gets big loads fast.

*Trademark

— turn page for more on fast-loading "B"

— more on fast-loading "B"

Why BIG B TOURNAPULL®

is your fastest-loading scraper

Instant, positive action of exclusive fingertip electric control is free of trouble caused by worn clutches, long cables, sloppy linkage, and leaky valves. Control is fast, weatherproof. Generator produces full power only when the demand for extra power is needed.

Exclusive LeTourneau-Westinghouse power-transfer differential . . . automatically diverts power to wheel on firmest footing when opposite wheel starts to slip. The BIG "B" keeps on working when other rigs bog down.

Low, wide, Fullpak bowl gets *big* loads *fast!* This tested design was introduced on the 18-yd. Model C Tournapull . . . has been in world-wide service for more than a year. This companion 27-yd. B Fullpak has the same easy-loading characteristics as the 18-yd. "C". You'll find it the fastest-loading scraper in the business!

High lift apron opens 7'1" to speed loading and unloading. Deflectors on yoke arms, and streamlined apron side-arms prevent trapping rocks and other chunky materials that might impede operations and involve manual cleaning. Positive forward ejection of load by snug-fitting tailgate wipes bowl clean of sticky materials in a single pass.

advertisement

with 27-yard FULLPAK*
for big-yardage earthmoving...

90° turning ability permits the BIG "B" to turn around in 39'10" . . . a space less than its own length. Makes it possible to work in confined areas . . . swing prime-mover side-to-side in soft going, to "walk" machine out of mud and sand.

Low yoke, high seat, give operator clear view of load and pusher. He can position his machine for faster contact and closer coordination with pusher . . . see the load, and control depth of cut for faster loading . . . see signal for quick break-away the moment load is heaped.

Tailgate is curved at top to roll material onto the heap, fill all corners. Curved apron carries a big part of load forward in its "belly", provides better weight distribution, lower center of gravity, improved stability in borrow pit or cut, and on haul-road or fill.

Low push-block gives direct-line application of power from pusher to blade. Bowl bottom has only 1° rise, permits nearly horizontal flow of dirt, packs in big loads *fast* with lively boil.

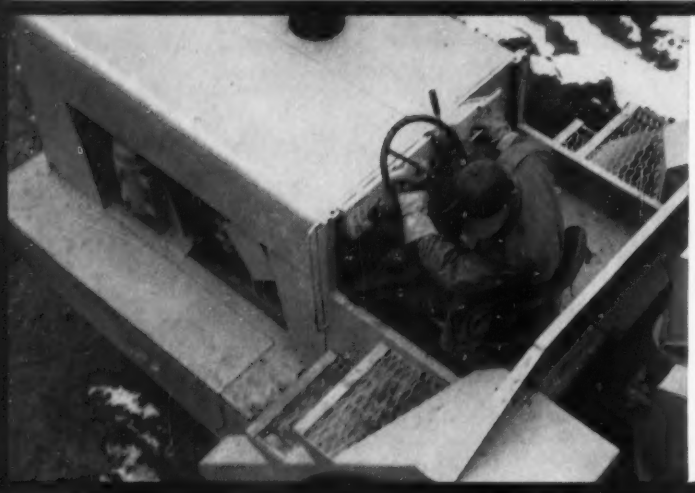
You get more pay-yards with the same push-power needed for 18 to 25-yd. scrapers. Because of its easy-loading advantages, the big 293 hp, 27-yard "B" gets heaped loads, in record time, without need for tandem pushers. This saves man-hours and pusher costs. Shown here is the 420 hp LeTourneau-Westinghouse Twin-C*, pushing the "B" for a 27-yard heap in less than a minute.

*Trademark

— turn page for more on new fast-loading "B"

— more on fast-loading "B"

Put these FAST-LOADING advantages of BIG B Tournapull® to work for you



Sit at the controls of the new BIG "B" . . .

Look ahead . . . you will notice you are sitting high . . . you can see where you're going, guide the big machine easily along narrow haul-roads, in the pit, on fill, and over rough terrain. You sit comfortably on a deep foam rubber cushion, lean against padded, posture-curved back. Seat may be adjusted 4 ways, for greatest comfort. Your left hand on power steering wheel, your right hand resting on rail over electric control switches, and you are the confident master of the top money-making scraper in its field!

See how fast the new FULLPAK* Scraper loads . . .

Turn your head to the left and look down at the 10' wide cutting edge of Fullpak's bowl. As the bowl is lowered to cutting position notice how the dirt flows into the pan horizontally . . . gains momentum as it strikes the tailgate . . . boils up and forward with fast and lively action. Then look beyond the scraper to the push-tractor. You will see what we mean by "direct-line-push" . . . the power of the pusher is applied from push-plate to scraper cutting edge in a direct line . . . for maximum "push" when loading.

See how load heaps to fill all corners . . .

Watch the dirt as it leaves the curved top of the tailgate and arcs forward to pile up on the apron and fill all corners of the pan. The action is fast! In ordinary material the Fullpak gets its heaped load in less than a minute. And you will notice how the crowned sides of the bowl hold a bigger heap . . . reduce spillage to a minimum. Notice, also, how the load is carried well forward in the bowl, for better weight distribution and greater stability when the big machine hits the haul-road and heads for the fill at speeds to 28 mph.

See how positive-action tailgate wipes bowl clean

Touch a fingertip switch, then watch Fullpak's positive-action tailgate move forward to eject the load. See how it wipes the bowl clean of mud, marl, or sticky clay in a single pass. No "carry-backs" here . . . the bowl is left clean. And you will notice that the inside of the bowl is cleanly designed, with no angular obstructions to block material flow. Operation of the tailgate is smooth, positive, efficient, and dependable.

Use BIG B Tournapull prime-mover with Rear-Dump or Lift-and-Carry Crane

When your work runs into blasted rock, or other shovel-loaded materials, you can interchange your Fullpak Scraper with a 35-ton "B" Rear-Dump . . . keep your Tournapull prime-mover working with no time lost. The "B" Rear-Dump is highly maneuverable . . . makes 180° turns in less than its overall length, offers a big target for dragline or shovel, makes over-the-edge dumps clean and safe. Tournapull Rear-Dumps are at work all over the world. You will find them profitable tools to include in your equipment spread.

You can further extend the work-capacity of your "B" prime-mover with a Tournapull Lift-and-Carry Crane. Use it to handle pipe, culverts, bridge steel, pre-cast concrete sections, heavy machinery, and parts. Use it to unload trucks and rail cars. "B" Crane has a capacity of 30 tons; maximum lift, 24'9"; reach, 25'.

These LeTourneau-Westinghouse trailing units may be interchanged quickly and easily with the Fullpak Scraper. Each may be purchased at about one-third the original cost of scraper and prime-mover. Ask for complete details.

Complete more work in less time . . . make more profits

If your work includes big-yardage contracts, you can use a fleet of BIG B Tournapulls, with new 27-yd. Fullpak Scrapers, for bigger production and bigger profits. Next time you have a big-volume job to figure, call in your LeTourneau-Westinghouse Distributor and let him help you determine the ownership-operating cost of a BIG "B". Then compare it with your present equipment. On yard-for-yard production, you will find it your top money-maker.

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264

Construction Methods AND EQUIPMENT

MAY, 1957

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HENRY T. PEREZ, Editor

Help for Highways

NO CONTRACTOR can possibly be unaware of the many construction problems involved in carrying through to completion the $100 billion highway program, now just one year old. But one non-construction problem that requires the contractors' help is public relations.

Building new roads and modernizing old ones is going to inconvenience the general public, to say the least. Acquisition of rights-of-way in most instances will infuriate those whose property is required, by-pass routes will be fought by town merchants, and abutting property owners will object to limited-access highways. In all these areas, advance education of the persons affected will do much to speed their final acquiescence, even if it never succeeds in gaining their active and enthusiastic support.

It is at the local level that such education must be given. And while it is primarily the responsibility of the state or other governmental unit to keep its citizens informed, the engineer and contractor must help.

The Federal Highway Act calls for public hearings prior to final route location for the Interstate System. These can become time-consuming affairs as self-interest groups make pleas to have the road run here or be shifted to there. And often these people do not know what they are talking about.

Take by-passes, for example. Many persons believe that if a main highway goes through an outlying section of the city, or misses it completely, the downtown area will stagnate. Well, it just isn't so! Relieving through-traffic from the necessity of crawling through crowded city streets benefits motorist and merchant alike. Those who would not stop anyway can proceed on their journey unhindered. And would-be shoppers no longer have to fight the hordes of cars and trucks that have no business downtown.

A somewhat similar situation exists with limited-access highways. Some owners and taxing bodies fear that such roads will reduce the value of adjacent lands. Here, too, they're misinformed. The limited-access highway makes outlying areas more-readily reached, attracts residents and industry to sections that heretofore took too long to travel to.

Such facts should be told to the public. And they should be told prior to the state's public hearing if they are to have most effect.

Educate the editor of your local newspapers, the chamber of commerce, your service clubs. Make sure that a vocal and misinformed minority can not hamstring a needed highway improvement. It is only thus that we can hope to keep the highway program anywhere near schedule.

TWIN CASTING BEDS 480 ft long each accommodate four prestressing lines. At peak production, plant produces 13 lines of piles a week. Each line can handle eight 60-ft piles. Koehring truck crane handles forms, and Lima crawler hoists long pile.

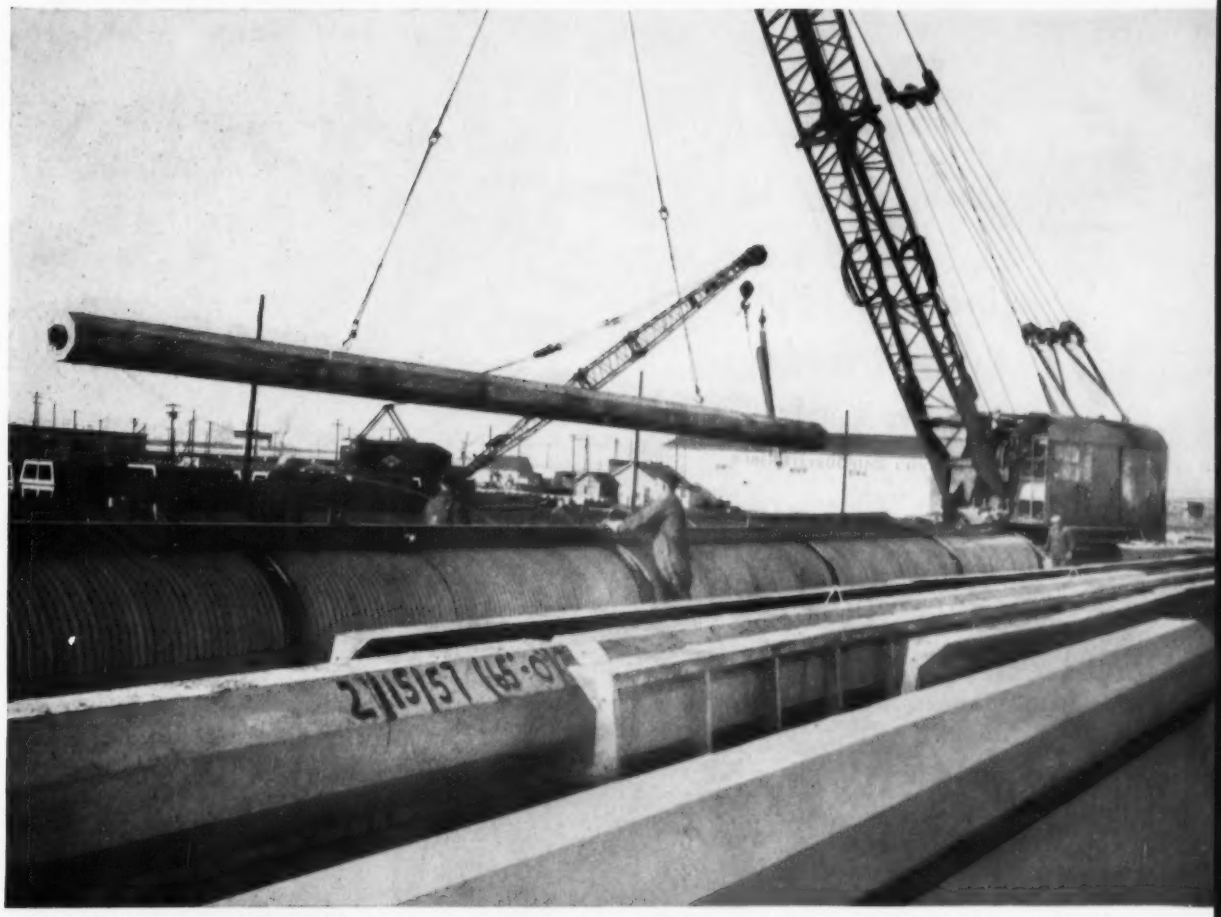
STEEL POSTS at each end of casting bed, two for each prestressing line, resist huge jacking forces. They are held in place by steel kicker plate anchored into abutment.

Prestress

A BRAND NEW prestress casting yard in New Jersey has scored a big hit on its opening performance. In less than four months, it turned out nearly 1,100 huge concrete piles. And at peak periods, it produced up to 104 units in a five-day week. That is undoubtedly a record.

Designed, built, and operated by Stock Construction Corp. for the Port of New York Authority, the yard embodies the latest techniques and devices for fast, efficient pile casting. It is well equipped, flexible, and built for long life.

It has to be. Located on the waterfront of Port Newark, it will be called on to supply a vast quantity of prestress members for the many Port Authority structures



CONCRETE PILE is removed from bed by crane. Long octagonal units with hollow cores are pretensioned with fourteen ⅜-in. seven-wire strands. They are driven at Port Newark, N.J., waterfront for new wharf owned by New York Port Authority.

Plant Turns Out Piles Fast

planned in the rapidly developing area.

The yard's first big order called for the casting of 65,000 linear ft of concrete piles and 796 deck slabs for a 2,400-ft wharf costing about $2,500,000. The entire job, including construction of the wharf, was awarded to Stock under a cost plus fixed-fee contract.

Designed by Stock's engineering department piles are 24-in. octagonal units averaging 60 ft in length. Weighing 10 tons each, they are cast with hollow cores made by 10-in. Sonovoids and pretensioned with fourteen Roebling ⅜-in. uncoated stress-relieved strands. These seven-wire strands are held in an 18-in. dia circular pattern, wrapped with a ¼-in. spiral. At the ends of each pile, the spiral is pitched at 1 in. For the next 3 ft the pitch is 3 in., and then 9 in. for the intermediate section. At the top of the pile, a 10-in. corrugated shell 3 ft long is cast into the concrete to increase bond with the poured-in-place cap.

Two Beds

To maintain a production of 64 piles a week, Stock set up two 480-ft beds each 25 ft wide. Flanked by 30-ft roadways, the beds each accommodate four prestressing lines. Steam and water pipes run along the outside of each bed underground and have outlets every 50 ft.

Because of unstable ground, both beds are supported on 40 ft wood piles. In fact, nearly 850 piles were required.

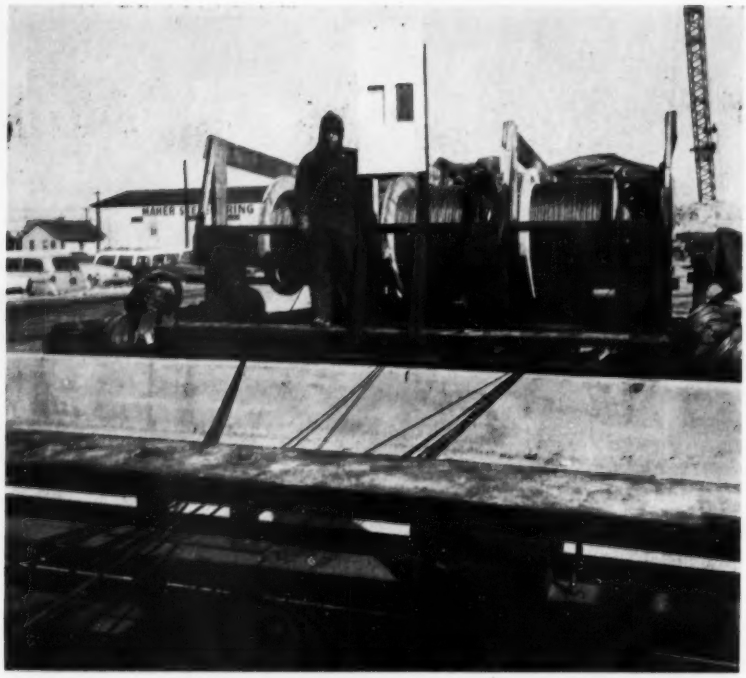
Each bed is designed to handle a maximum force of 1,200 tons acting 1 ft above the bed. This force is resisted by 5-ft thick concrete abutments at each end and also by an 18-in. thick bed. (To permit future use of only half a bed, the center section thickens to 5 ft and provides inserts for holding reaction posts.)

Reaction posts at each end are 27-in. steel beams, two for each prestressing line. Instead of the conventional method of anchoring these posts 30 ft deep in blocks of concrete, Stock holds the base ends with 14-in. steel-beam kicker plates anchored into the abutment with 1¼-in. rods about 5 in. apart. Kickers are only 4 ft below the surface of the bed.

continued on next page

PRESTRESS PLANT . . .
continued

Winched Dolly Pulls Strands From Reels, Drops Spirals Along Way



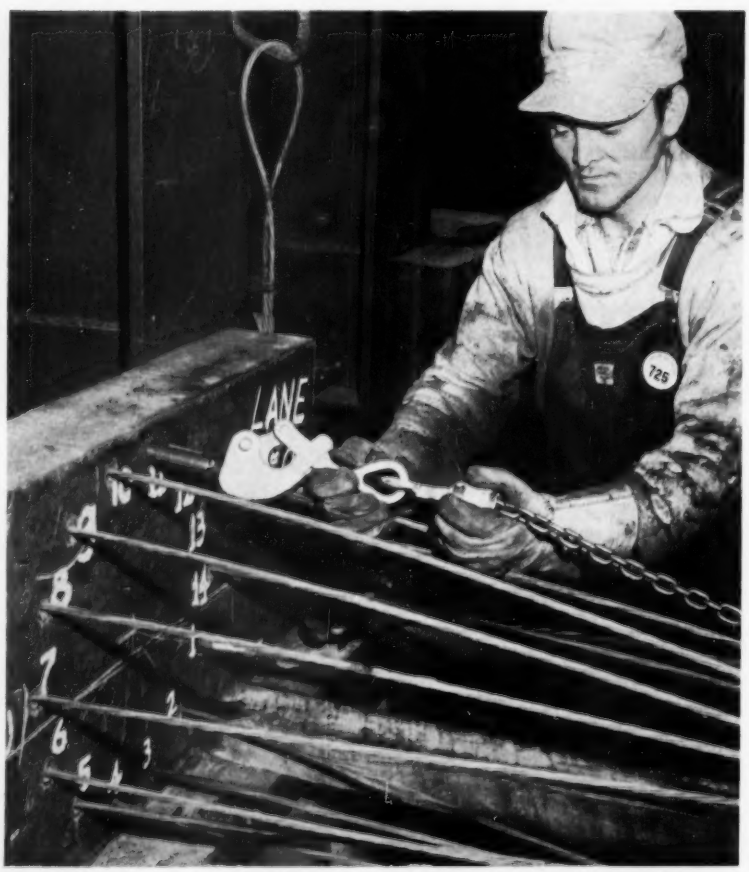
STAND holds 18 reels of strand. Its front end is elevated to prevent entanglement. Strands are guided to bed by fairleads. Signaling device directs winch operator.

Typical Cycle

A stand of 18 reels is set up at the anchor end of each bed. The forward end of the stand is elevated to prevent entanglement when strand is paid from all reels simultaneously. A reel holds 15,000 ft of strand.

Fairleads both on the stand and on the anchorage abutment guide strand to any one of the four prestressing lines. Pulled by hand, strands are fed one at a time through appropriate holes in an anchor plate mounted on a pair of reaction posts. From here, strands are pushed between the posts and into a dolly. They are fed through eight rolls of spiral wire hanging from the dolly and then anchored to a templet at the front end of the dolly. Conventional Reliable vises quickly secure the ends of the strands.

When all 14 strands are in place, the dolly is pulled from the opposite end of the bed by a Clyde hoist, mounted on rails so that it can be moved back and forth to service both ends. Straddling a steel soffit anchored to the bed, the dolly easily is kept on line. And every 60 ft, a reel of spiral wire is cut loose and left on the bed so that it will be simple to spread later. When the dolly arrives at the jacking end of the bed, the steel templet is removed



INITIAL TENSION of 1,000 lb is placed on each strand by Klein grip pulled by dynamometer. Reliable vises anchor strands to plate. Method assures uniform tension.

WORKER feeds strands one at a time through holes in anchor templet, then locks them to jacking templet carried on front of dolly.

DOLLY straddles soffit form as it is winched along bed. Coils of spiral are cut loose every 60 ft to simplify spreading later.

STEEL BULKHEAD also serves as strand positioner. It is placed by lowering along vertical axis of strand pattern, then rotating 90 deg. Worker slips strands into slots.

and bolted to four pull-rods, permanently positioned in a horizontal steel waler extending across all eight reaction posts.

Initial Tensioning

With jacking templet anchored to the waler, strands can be cut from the reels at the opposite end of the bed and locked there to the anchor plate. One by one, they are fitted loosely with a strand vise. Then to remove slack and assure uniform tension, they are pulled by a dynomometer to a 1,000-lb force. The vise is pushed to the plate, locking the strand in tension. This operation is repeated on the entire pattern.

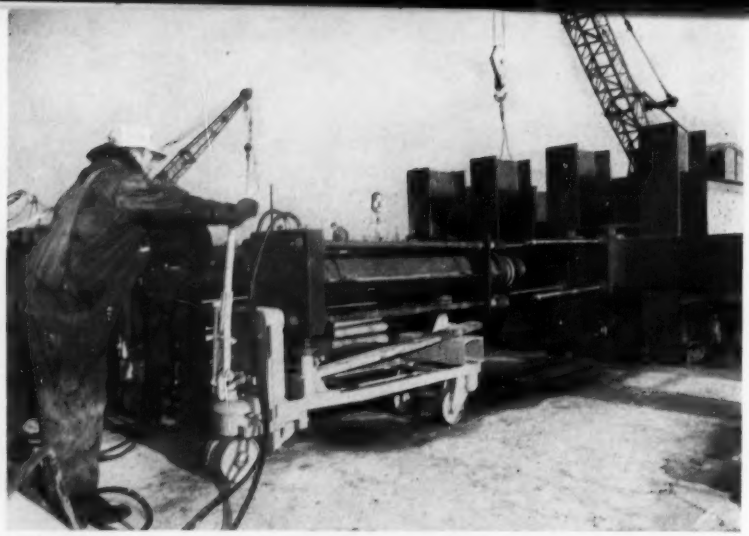
Before jacking, workers move along the 480-ft bed inserting Sonovoid tubes and placing the combination bulkhead-strand positioners. So long as the strands are under only slight tension, these operations are simple.

The steel bulkhead is a clever one-piece plate with horizontal slots at the level of each strand. It is placed by first lowering along the vertical axis of the strand pattern. Then, a worker slowly rotates it 90 deg as he guides the strands into the slots.

Jacking

Stationed in a 21-ft working pit at the end of each bed are two 200-ton Pine hydraulic jacks. Hy-

Pair of Jacks Handle Each Casting Bed



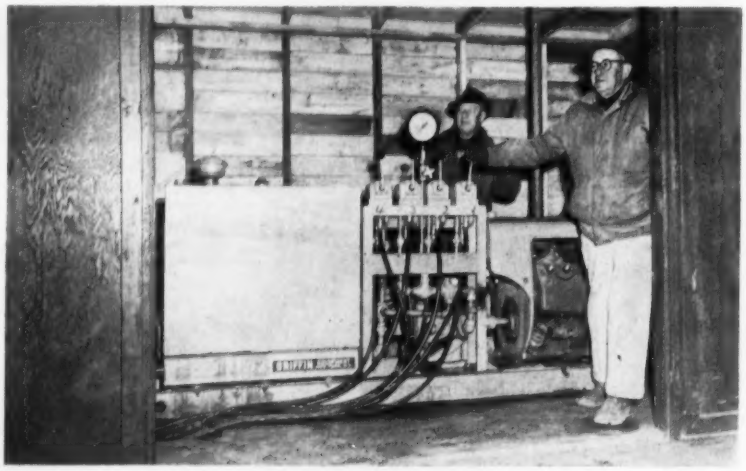
MOUNTED on lift truck, 200-ton Pine Jack centered within four permanent pull-rods is coupled to corresponding rods in abutment. Springs under jack permit slight bending.

draulically retractable, they have threaded rams fitted with safety nut collars. They are held in special carriages mounted on Barrett lift trucks which permit easy height adjustment and also provide excellent mobility. A combination rubber and spring support underneath allows the jack enough movement to compensate for any bending resulting from unbalanced forces.

Each jack is mounted in the carriage at the center of gravity of four permanent pull-rods. When a prestressing line is ready for tensioning, a jack is rolled into position, and its four pull-rods are coupled to four corresponding pull-rods in the waler.

The strand pattern now is ready for tensioning. A valve is opened at the hydraulic pump, and the ram extends a short distance to the waler. It continues to extend, moving the jack backward with the lift truck, pulling the templet, and tensioning the strands.

During the entire operation, a worker keeps a large safety nut on the ram turned up tight to prevent any rebound in case of failure of a hydraulic line.



HYDRAULIC SYSTEM can handle four jacks at a time. Denison pump powered by Wisconsin engine has capacity of better than 3½ gpm. Hoses run underground to jacking pits.

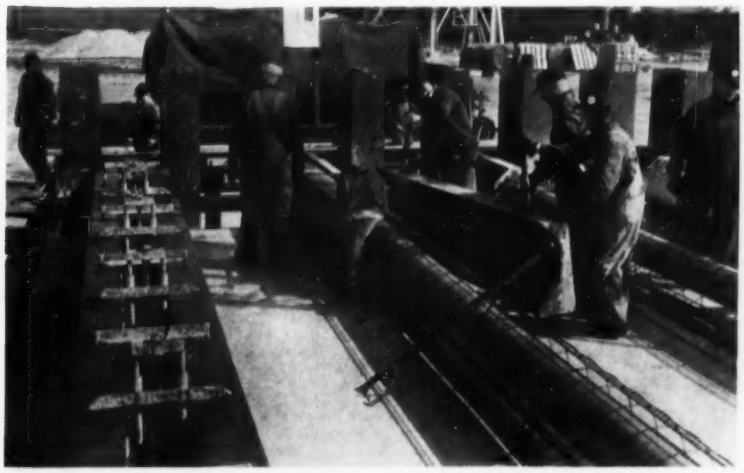
Hydraulic System

The hydraulic system consists of a gasoline-engine-powered Denison pump and an 80-gal reservoir, enough capacity for four jacks. This pump system was assembled by the Griffin Equipment Co. The system has a minimum capacity of 3½ gpm, and it can operate four jacks at once.

Jacking is continued until the additional elongation is 32¼ in., and the corresponding line pressure is 3,920 psi. At this point, nuts on the four pull rods are turned up tight against the waler to release the load on the jack. Pull-rods then are uncoupled, and the

SAFETY NUT is turned up tight on threaded ram in case of line failure. Elongation is checked with ruler as nuts are turned on pull-rods to transfer load from jack.

CRIMPED WIRE is placed along each side of pile to position ¼-in. spiral. Pitch of spiral is 9 in., except at ends. Sonovoid tubes form 10-in. hollow core in pile.



FORM PANEL is swung into place by crane, then tied through soffit to opposite panel. This end panel is short. All others are handled in 30-ft lengths for better efficiency.

CONVEYOR mounted on front of modified trencher carries mix from ready-mix truck and chutes it directly into forms. It can reach all prestressing lines.

Efficient Forms, Mobile Conveyor Speed Casting

jack is free. Total load in each strand is 14,000 lb, or 176,000 psi.

Work now resumes on the bed itself. Spirals are stretched over the strands and, to assure proper pitch, are tied to a crimped wire placed along each side of the circular strand pattern. It is tied to the spiral at about every third crimp. This special wire was developed specifically for the job by the Richmond Screw Anchor Co.

At the ends of each pile, the bulkheads that were inserted before jacking now are positioned accurately and braced against steel bars clamped to strands. At the same time, Sonovoids are supported the proper distance above soffit on wire chairs.

Forms

Next step in the sequence is placing steel Formcrete forms, manufactured by the Food Machinery and Chemical Corp. Supplied in 10-ft lengths, they are bolted into 30-ft sections for more efficient handling. Forms are swung into place by crane and tied to the soffit. Across the top, steel spreader bars fit neatly into slots in the tops of the side forms, tying them together.

Every other spreader is modified to serve as a Sonovoid hold-down device. It consists of a Richmond form screw threaded into a pipe yoke fitted with a chair-like wire that presses on the top of the Sonovoid. Final operation is placing lifting cables at the quarter points of the pile.

Concrete Placing

As soon as forms are in place, concrete is batched in an on-site plant and mixed in Jaeger 5-yd ready-mix trucks. Made with Nazareth high early strength, air-entrained cement, concrete reaches a strength of 5,000 psi in 27 days.

CORRUGATED metal hood 50 ft long jacketed with tarps is placed over fresh concrete by Koehring crane.

STEAM enters hoods through inlets and is distributed full length by pipe with jet holes. Littleford generator supplies 3,500 lb per hr.

PRESTRESS PLANT . . .
continued

Steam Curing For 14 Hours Under Metal Hoods Prepares Piles For Stripping

FORM STRIPPING is simple matter of removing spreaders and ties, then breaking panels loose with peavy. Detensioning helps strip because it forces piles to slide slightly.

To speed placing of the stiff 3-in. slump mix, Stock turned to a conveyor method of handling. They removed the excavating ladder from a Cleveland trencher and replaced it with a Con-Vay-It conveyor. Mounted on a swivel and hung from an A-frame, the conveyor has proved itself a useful tool on this job.

Concrete is chuted from a ready-mix truck into a hopper at the base of the conveyor. Aided by vibration, the mix moves on to the belt, drops into a chute at the end, and falls directly into the forms. Internal vibration consolidates the mix, reducing the chances of honeycombing. Hold-down devices are released about 2 hr after pouring.

Curing

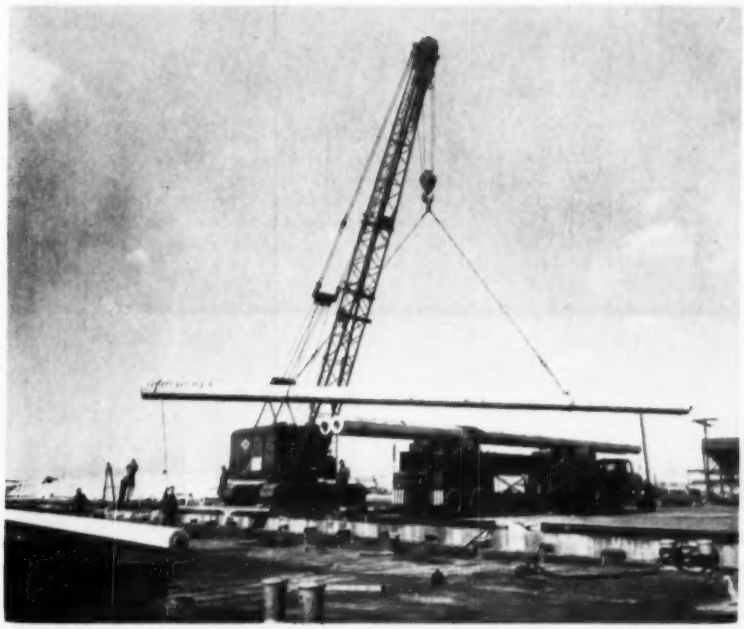
As soon as a pour is completed, forms are covered with 50-ft corrugated metal hoods jacketed with tarps. Each hood has one inlet which distributes steam along the full length by means of a pipe with jet holes. Steam is supplied by a Littleford 135-hp generator at the rate of 3,500 lb per hr, or 4,520,000 btu per hr. It is piped across the center of the two beds in a transverse main and distributed in both directions.

Soon after pouring, a small amount of steam is admitted under the hoods to maintain a concrete temperature of about 70 deg for the first 4 hr. Then it is raised at the rate of 20 deg per hr for the next 3 hr, maintained at 125-140 deg for the next 4 or 5 hr, and allowed to cool for another 3 hr.

At this point, generally it is the

Trailer And Barge Haul Long Units To Piledriver

CUTTING TORCH burns strands between adjoining piles. Bulkheads are removed later.



LONG PILE hoisted from steel carriage on trailer is swung by Lima crane to barge. Loaded barges are towed short distance down Port Newark channel to construction site.

PILEDRIVER, a barge-mounted Koehring 1205, swings pile under Vulcan hammer.

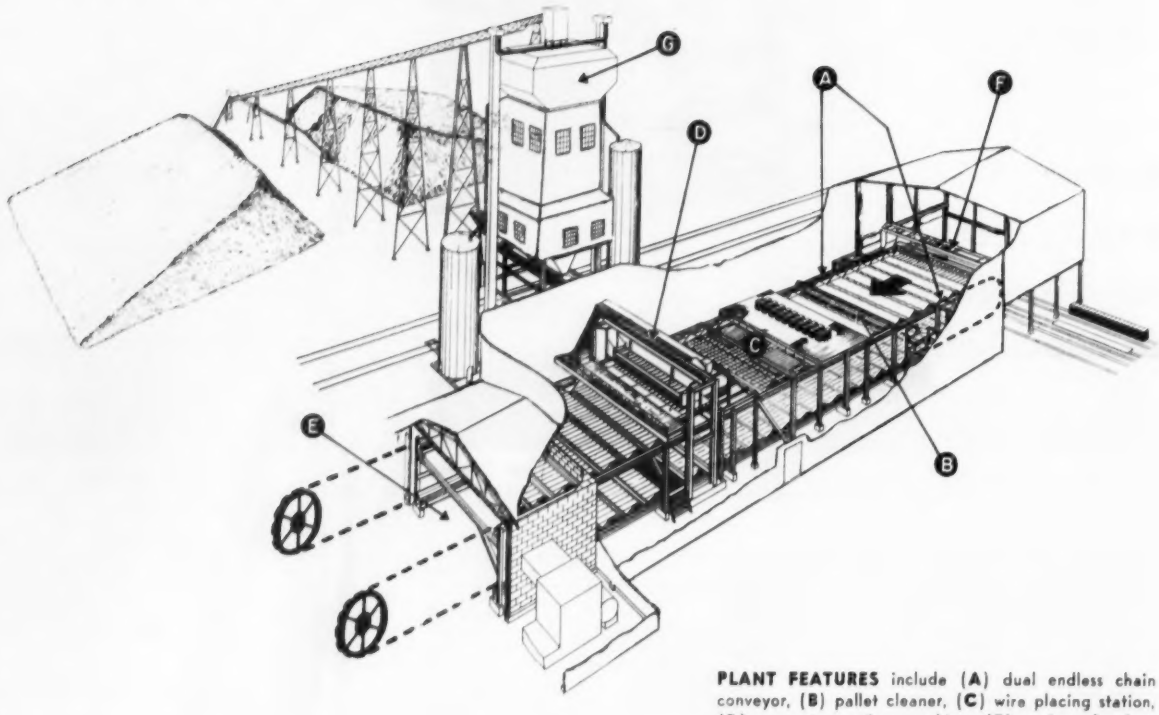
next morning. The concrete has reached a strength of 3,500 psi, and piles are ready to be removed. Workmen disconnect form ties and recouple the jack for detensioning. Releasing tension in the strands helps break the bond between forms and concrete, simplifying stripping.

Strand between piles is cut with torches, and the big units are loaded on to a special steel frame mounted on a trailer. They are hauled a short distance to the waterfront, loaded on a barge, and carried about a mile to the wharf construction site. Here, piles are driven by two rigs—a Wiley Whirly and a Koehring 1205 mounted on a barge. Both are outfitted with Vulcan No. 0 hammers.

Deck Slabs

The casting yard's second big order involves about 800 channel-shaped slabs. They are about 6 ft wide, 2 ft deep, and either 10 or 16 ft long. The longer units are pretensioned with thirty-six ⅜-in. strands, 18 in. each leg. Prestressing methods are similar to those employed on the piles except that the forms are different and two jacks are required.

The work is under the general direction of John M. Kyle, chief engineer of the N.Y. Port Authority, with Louis F. Booth, engineer of construction, and Fred Fontanella, resident engineer. Construction work is being executed by Stock Construction Corp., Gilbert M. Serber, president, Michael Dorcic, general superintendent, and George Flay, chief engineer.



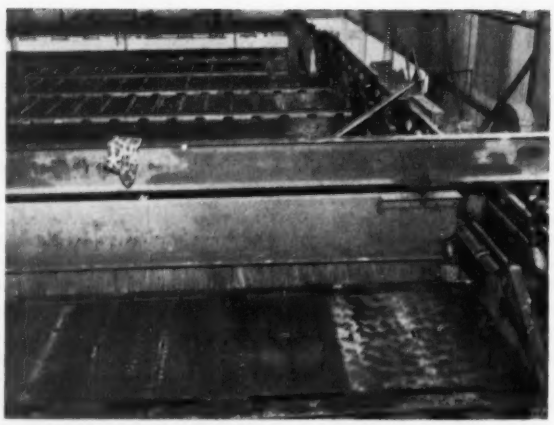
PLANT FEATURES include (**A**) dual endless chain conveyor, (**B**) pallet cleaner, (**C**) wire placing station, (**D**) concrete casting machine, (**E**) curing chamber, and (**F**) unloading station. Concrete plant (**G**) produces extra-dry mix used. At right, machine-made mats are stored in field alongside casting plant.

Semi-Automatic Casting Plant

TO PROTECT THE BANKS of the lower Mississippi River, the U. S. Army's Corps of Engineers for years has placed articulated concrete mattresses at points of erosion. The mattresses are made up of a series of 4x25-ft mats 3 in. thick. Weighing 3,300 lb, each mat consists of 20 individual concrete blocks held together by embedded copper-clad steel fabric.

The mats formerly were produced on outdoor casting beds more than a mile long, requiring 600 to 1,000 steel forms and a work force of 80 to 100 men. Now, in a Greenville, Miss., plant of the Vicksburg Engineer District, a crew of only 25 men can turn out 80 mats per hr, regardless of the weather.

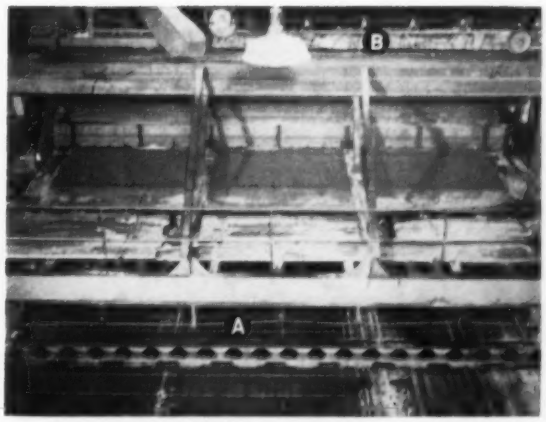
The mats are made on sheet-steel pallets carried through the 500-ft-long plant on a 468-ft, two-level chain conveyor moving constantly at 6 ft per min. On the upper level, the pallet is cleaned and oiled, wire fabric is placed, and concrete is poured and vibrated. Then the mat enters a curing kiln. At the end of the run, the conveyor descends 12 ft carrying the mat back out of the kiln to an unloading station. A step-by-step picture story of the process follows.



1. **BRUSH CLEANS PALLETS** as they pass beneath it. Sheet-steel pallet rests on framed cradle that is suspended by shafts from two-wheel trucks riding rails at each end. Trucks are hooked to endless chain conveyor that moves units through plant.

Mass-Produces Mattress Units

2. MEN PLACE WIRE FABRIC on brushed pallet. Loops at ends of long wires will be hooked over fittings on pallet to keep fabric in place. Normally, this is the only hand labor needed in the mat-making process; other operations are mechanized.



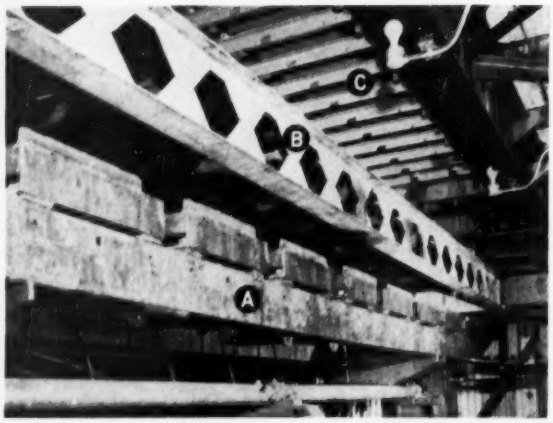
3. OIL COATS PALLETS as they pass beneath drip pipe (A) to prevent concrete from sticking. Cradle with its oiled pallet now will be unhooked from the chain conveyor and will be quickly positioned under the concrete casting machine (B).

Casting the Mats Is Intricate Operation

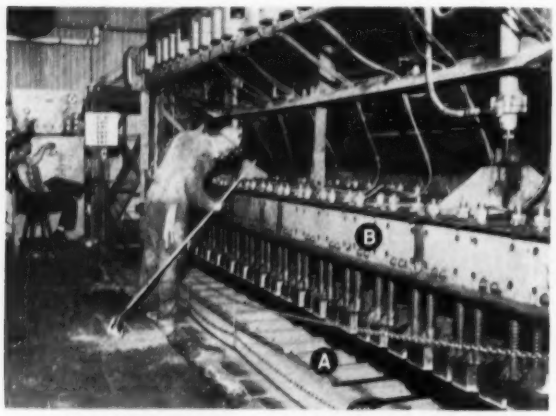
MOST UNUSUAL PART of the mat-making process is casting of concrete on the steel pallets. These rest on cradles moved through the plant by the chain conveyor. As a cradle approaches the casting machine, it automatically is unhooked from the chains and whisked ahead 7 ft in only 3 sec by two hydraulic rams. This positions cradle and pallet directly under a series of bottomless molds in the casting machine.

Here a frame is raised hydraulically to push the pallet up off its cradle and hold it tight against the underside of the mold box. Concrete conveyed to a hopper in the casting machine falls to a feeder drawer that moves across the molds to fill them, then retracts to screed the surface.

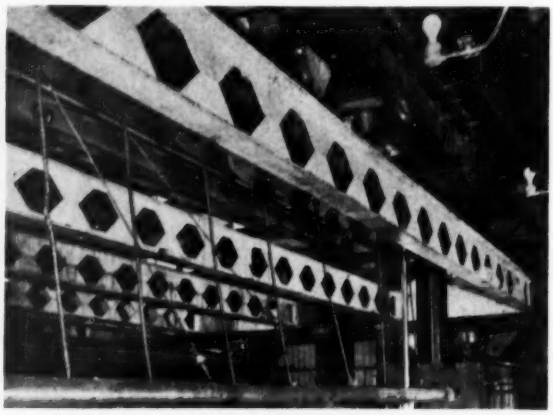
Next, vibrators attached to the lifting frame underneath the pallet are turned on, and a series of vibrating tampers descends to the surface of the concrete to consolidate the stiff mix. The frame then lowers the pallet, now carrying a cast mat, back down onto its cradle. This again is moved ahead at the accelerated rate (2 1/3 fps) to regain its position on the still-moving chain conveyor.



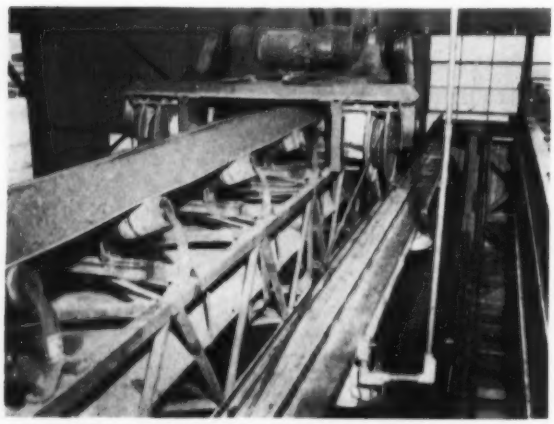
4. CRADLE SITS IN POSITION in casting machine, having been moved ahead 7 ft in 3 sec by hydraulic rams. Lifting frame (A) will immediately raise pallet off of its cradle (B) and hold it tight against underside of bottomless mold box (C).



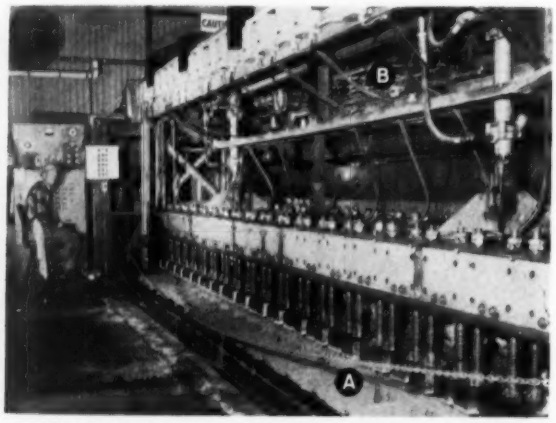
5. BOTTOMLESS MOLDS WAIT ABOVE for pallet, which is somewhat larger than 4x25-ft mat that will be cast upon it, to be raised to act as bottom. Above bottomless molds (A) is vibrator assembly (B), with machine's control panel at far left.



6. HYDRAULIC RAMS RAISE FRAME to lift pallet from its cradle and push it up to mold box. Heavy racked arms at each end of frame prevent warping during lift. Underside of frame carries ten Jackson vibrators that will go on after casting.



7. SHUTTLE CONVEYOR DELIVERS CONCRETE, picking up belt-load of mix from concrete plant and feeding it into casting machine's hopper below, as conveyor moves along tracks. A 3-hp motor drives the belt; a 7½-hp unit drives track wheels.



8. FEEDER DRAWER SLIDES OUT to fill the mold box with concrete. Drawer (A) itself had been loaded with concrete from series of hoppers inside the casting machine to which partially visible shuttle conveyor (B) had delivered the mix.

continued on page 104

ANOTHER CATERPILLAR FIRST!

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ENGINE POWER CERTIFICATION

This is to certify that the Diesel Engine herein described has been engineered, manufactured and tested in accordance with rigid Caterpillar Standards. The materials and workmanship incorporated into this engine give it the inherent capacity for satisfactory performance when applied in accordance with the power ratings established and recommended by this company. The MAXIMUM OUTPUT capacity of this standard production engine is 200 H.P. @ 2000 R.P.M. equipped with: air cleaner, water pump, lubricating oil pump, fuel pump, and standard intake and exhaust manifolds.

I certify that B. L. Henson, Supervisor of Diesel Engine Test, Caterpillar Tractor Co., [illegible] Certification and I affix my [illegible] day [illegible] 19 57

B. L. Henson
Supervisor Diesel Engine Test
Caterpillar Tractor Co.
Peoria, Illinois

[illegible] /58

Caterpillar Model D326 Industrial was manufactured and shipped as follows: Engine Serial No. 39R1018 Shipping Date February 11, 1957

Power Setting 152 H.P. @ 1600 R.P.M. Intermittent Power Rating

Radiator & Fan	Tachometer Drive
Ether Starting Aid	Muffler
32V Charging Generator	Heater Connections
Governor Control	Remote Shut-off

POWER RATINGS

MAXIMUM OUTPUT is the horsepower capacity of the engine, a measure of the maximum power, it [illegible] that can be developed for five minutes without drop in speed.

INTERMITTENT HORSEPOWER is a rating for use in variable load applications such as excavators, hoists, and standby power units, where the duration of sustained full power output is one hour or less, with the average output not over 80% of Intermittent Horsepower.

RATED HORSEPOWER is a rating for use in applications such as planing mills, hammer mills, and rock crushers where the duration of sustained full power output is 12 hours or less.

CONTINUOUS HORSEPOWER is a rating for use in applications such as work boats and pumps where the duration of sustained full power output is 24 hours per day, day in—day out.

Horsepower figures are established in accordance with rigid Caterpillar standards. All ratings, corrected to sea level barometric pressure (29.92 in. Hg.) and standard temperature (60° F), apply to a production engine including air cleaner, water pump, lubricating oil pump, fuel pump and standard intake and exhaust manifolds. The above ratings are based on British and American BHP

Printed in U.S.A.

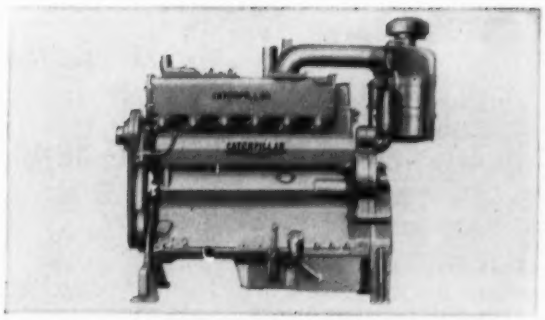
FORM NO. SIS 37553

In a quarter century of diesel leadership Caterpillar Engines have achieved a reputation for *honestly rated power*. Owners have found that they can depend on a Cat Diesel to deliver the power promised.

Now, to back this reputation, Caterpillar becomes the *first* manufacturer to issue a certificate showing the horsepower capabilities of the engine. This certificate is signed by Caterpillar Tractor Co. and certified by a notary public.

You have a right to demand *certified power* when you invest in an engine. You get it when you buy from your Caterpillar Dealer. Let him show you the certified power plant that fits your needs.

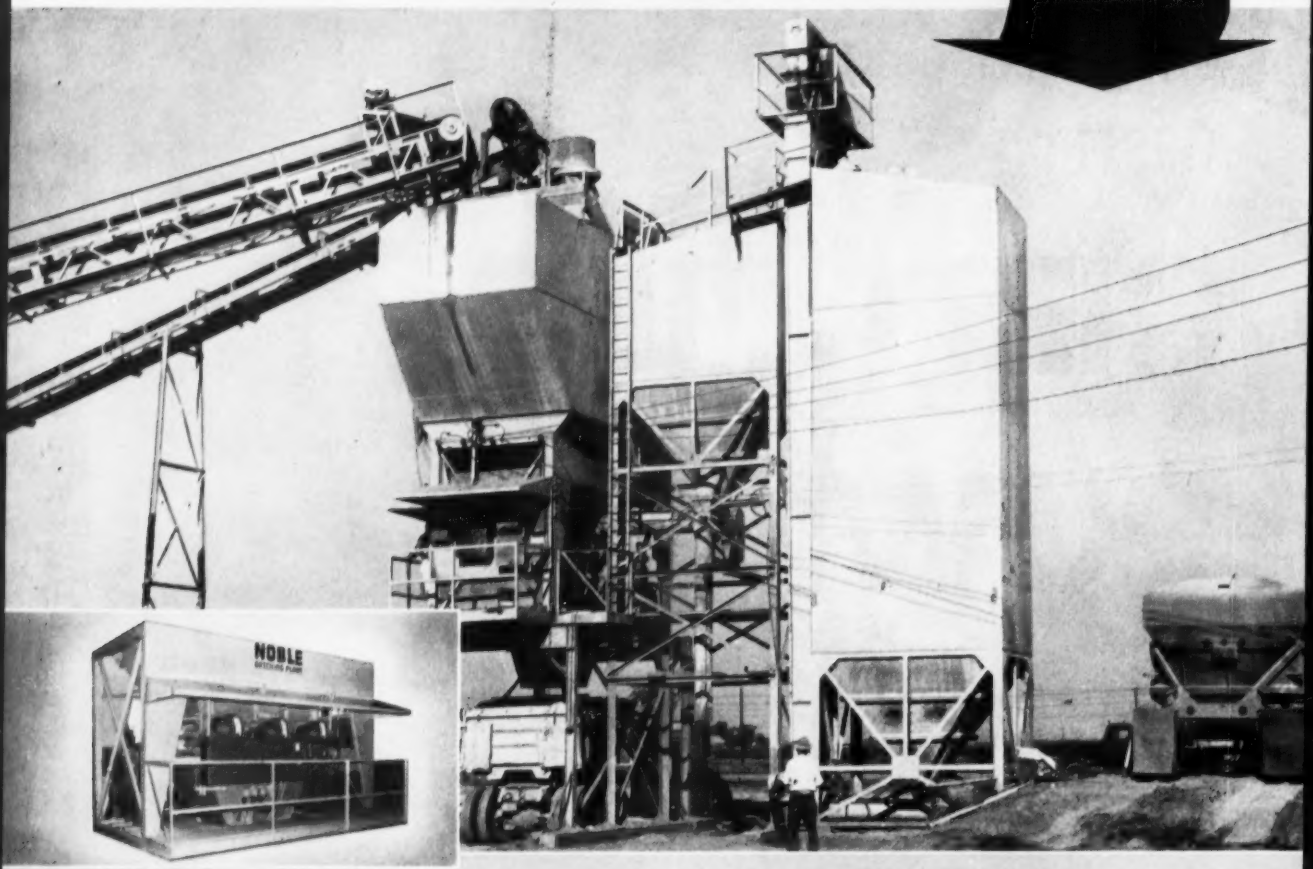
Caterpillar Tractor Co., Peoria, Illinois, U. S. A.



CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

NOBLE TRIPLE BATCHER produces one operator in 1 stop or



Bin center section can be truck-hauled without removing weigh hoppers, operator controls or any other components. All electrical switches are mounted in this unit and connections are made by simple twist-lock couplings.

3 pen recorder, optional equipment, produces record of each material as required by Corps of Engineers specifications. Adaptable to 1 or 2 stop set-up.

✓ Weighs 3 materials for a single batch at one time! *(sand, coarse aggregates, cement)*

✓ Batches accurately to rigid specifications!

✓ Supplies 2 or 3 dual drum pavers!

Lowest erection costs. Noble comes completely equipped ready for batching. Factory assembled sections, all within legal width for highway transport, are quickly erected on timbers or concrete.

NOBLE CONCRETE BATCHING PLANTS

WRITE FOR CIRCULAR

THE NOBLE COMPANY • 1860-7TH ST., OAKLAND 20, CALIF. • TEMPLEBAR 2-5785
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518 First Ave. North, Seattle, Wash. MUtual 4878
218 Richmond St., El Segundo (Los Angeles), Calif. EAstgate 2-4518
International Sales Agent: Frazar International Corp., San Francisco

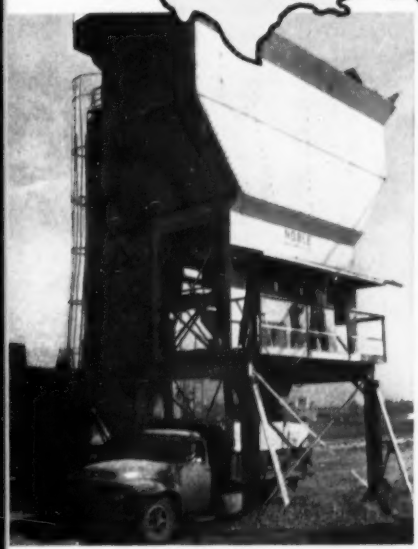
over 300 yards per hour with 2 stop set-up

PORTABLE! LARGEST COMPONENT MEASURES 8' x 10'6" x 36'

FROM COAST TO COAST

Left—Supplying 3 pavers on California air base construction. Produced 3500 cubic yards in 10 hour period. 36" coarse aggregate conveyor, 24" sand conveyor. Cement silo has facilities for direct loading of cement spreader trucks.

Below—On New England paving job.



For short stretch paving, come back work, tunnels, bridges, use...

NOBLE-MOBILE Batching Plant on Wheels

Convair Aircraft taxiways

Bureau of Reclamation siphon, Othello, Wash.

Ohio highway paving

Batches at the job site where hauls are shorter and profits longer. 100% complete plant. 65 to 125 yards per hour. Scooploader, crane or conveyor loaded. Supplies transit mix, dry batch or premix.

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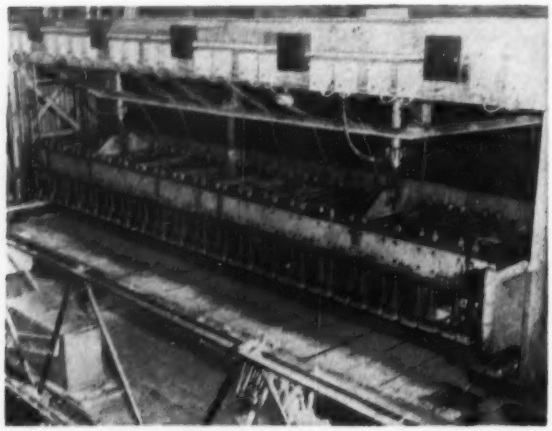
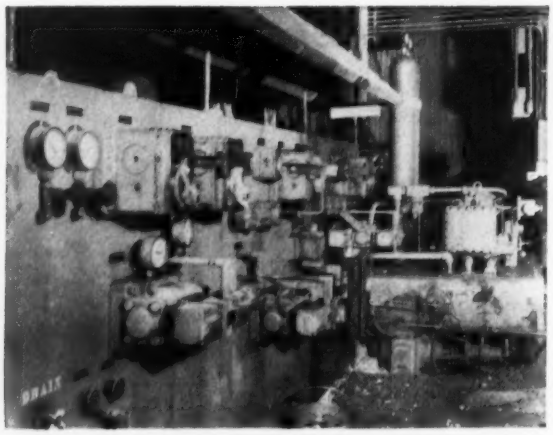
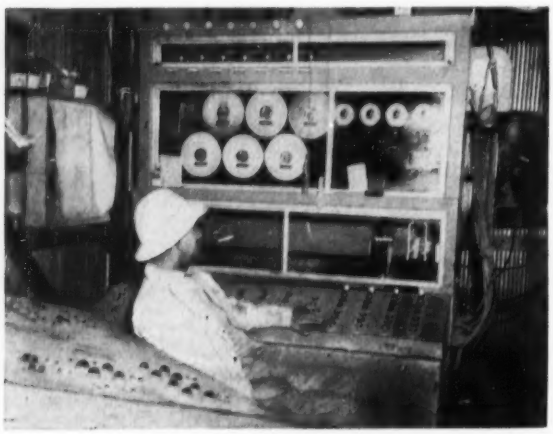


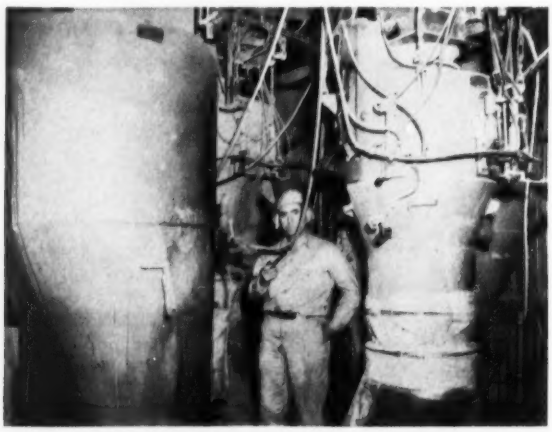
9. FEEDER DRAWER RETRACTS to strike off concrete flush with top of mold box. Vibrator head carrying 20 tamping units now will descend to consolidate concrete for 20 sec, then lifting frame below will lower pallet and mat down to its cradle.



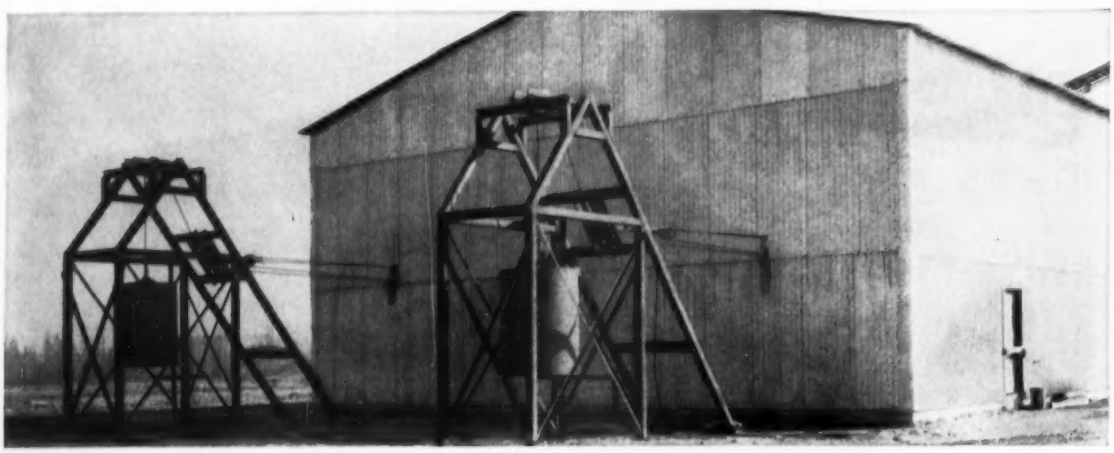
10. HYDRAULICS PLAY LARGE PART in casting machine operation, as indicated by this control installation by Edwards Engineering Corp. Mechanized plant in 40x500-ft building turns out mats at rate of 80 per hr. Complete cycle takes 2 hr.



11. CONCRETE MIX IS CONTROLLED from panel of Johnson automatic plant. Because of low water/cement ratio (only 4½ gal per sack) concrete is mixed in four 50-cu-ft paddle type mixers rather than in the more conventional revolving drums.

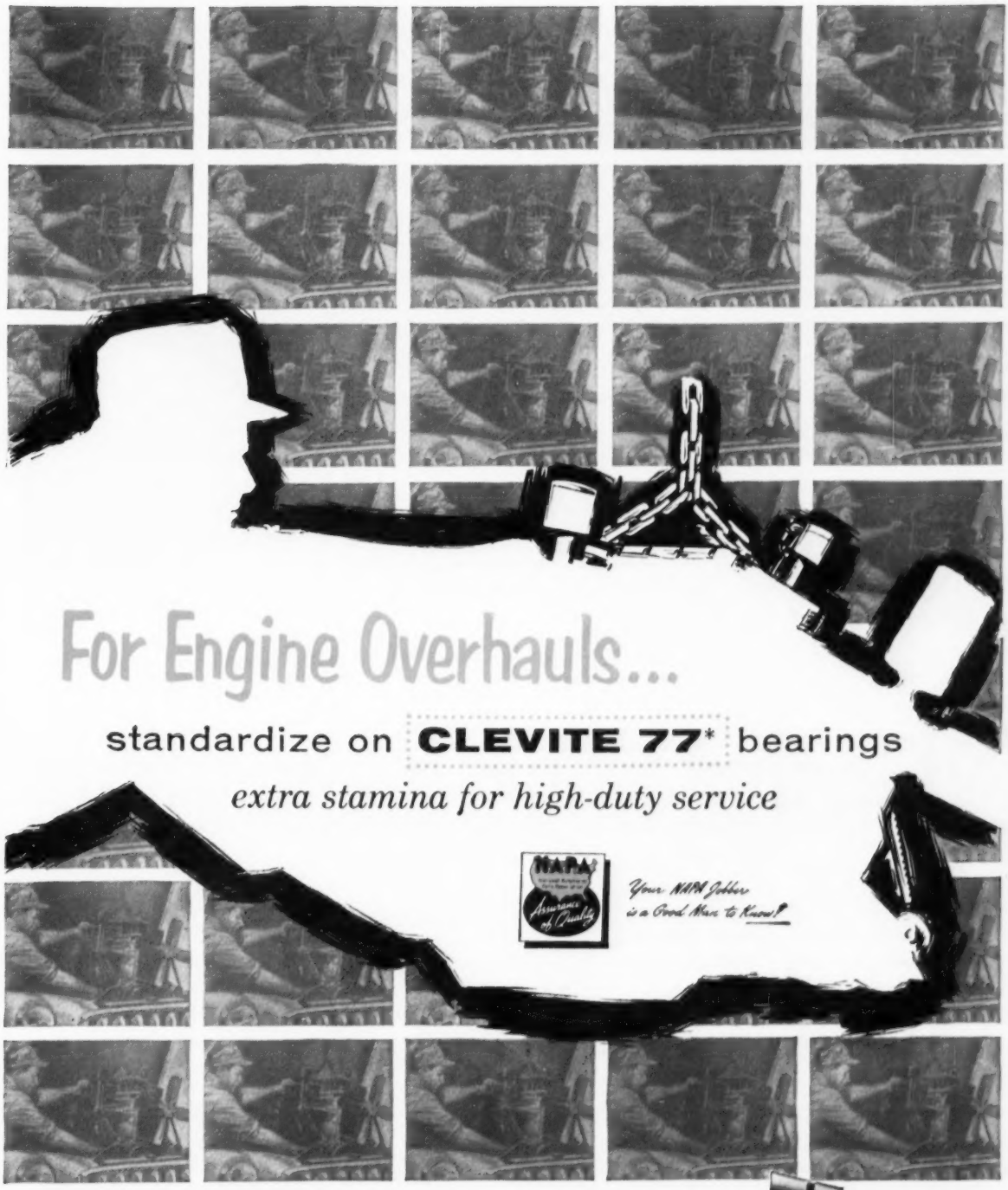


12. AGGREGATES ARE BATCHED automatically. Concrete mix contains equal parts of sand and gravel (1-in. maximum size), 2% limestone, dust, 2% calcium chloride, and 3¾ bags of cement per cu yd. Mix entrains approximately 7% air.



13. CHAIN CONVEYOR IS HELD TAUT by two 5,000-lb counterweights. The Link Belt conveyor is 468-ft long on two levels, with 12 ft between levels. Dual endless chains are about 28 ft apart and are driven by four 5-hp electric motors through a synchronous drive. Traveling constantly at 6 fpm, chains carry a total of 161 pallet cradles 6 ft on centers.

continued on page 107



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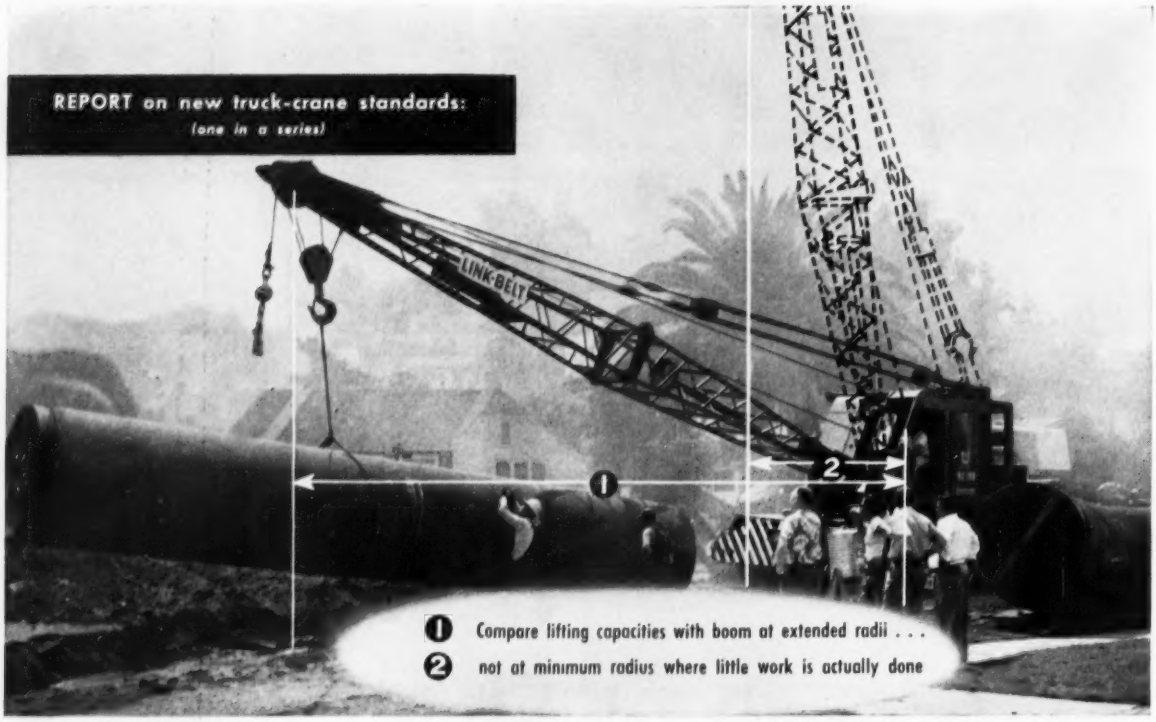

REPORT on new truck-crane standards:
(one in a series)
LINK-BELT
1
2
1 Compare lifting capacities with boom at extended radii . . .
2 not at minimum radius where little work is actually done

TRUCK-CRANE PRODUCTION: Most truck-crane jobs require using long booms at extended radii. Under these circumstances, Link-Belt Speeder machines are unsurpassed. Why? Because of high strength-alloy booms and new high-capacity jibs, extra "live" weight, strategically located uppers for better balance and stability plus advanced-design features such as clutch *up* and *down* on boomhoist.

Extending truck-crane utility

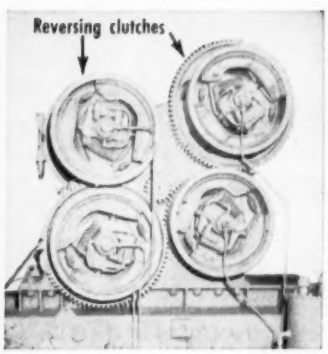
With new increased lifting capacity at extended radii plus outstanding mobility, Link-Belt Speeder Zephyr-cranes handle many jobs formerly handled by crawlers

Truck-crane production is directly related to lifting capacity. But lifting capacity varies with boom length and radius.

Thus, it's important to measure capacity on the basis of a boom out 25 feet and beyond where the bulk of the work is done. You'll be amazed to find that a Link-Belt Speeder far outperforms other similarly rated machines.

It's one of many ways a Link-Belt Speeder helps set new, more profitable standards of truck-crane operation. Contact your Link-Belt Speeder distributor or write for details. LINK-BELT SPEEDER CORPORATION, CEDAR RAPIDS, IOWA.

FAST, POSITIVE, SAFE CONTROL —True power hydraulic controls are a Link-Belt Speeder exclusive . . . utilize oil under pressure to do the work. The operator merely flips short-throw levers. Smooth - operating hydraulic - actuated clutches provide perfect feel of the load at all times.



LOAD LOWERING CLUTCHES —Hydraulic-actuated reversing clutches are available for either or both main drums. They provide power load lowering of main hoist line and jib whip line. All clutches are interchangeable within a given machine . . . are self-adjusting for heat and normal lining wear.

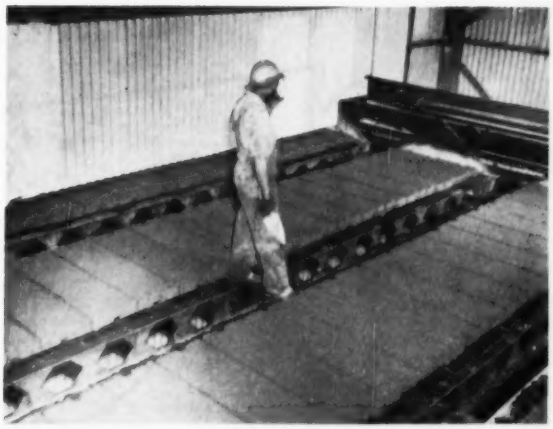
14,530

It's time to compare . . . with

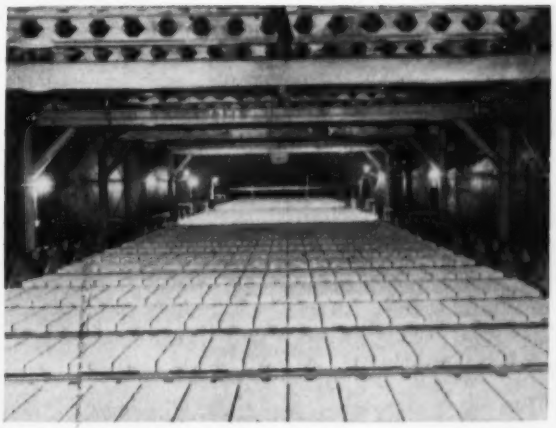
LINK-BELT SPEEDER

Builders of a complete line of shovel-cranes . . . with exclusive Speed-o-Matic power hydraulic controls

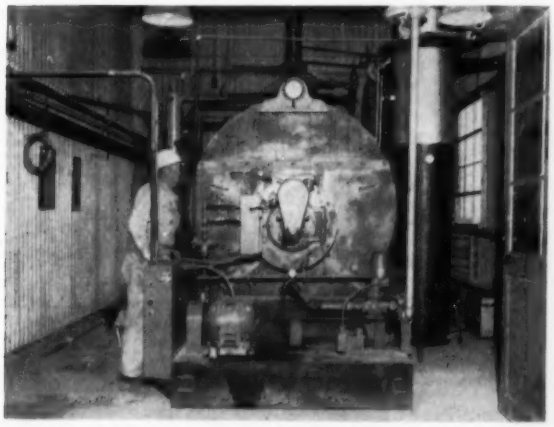
Curing the Mats Is Longest Process



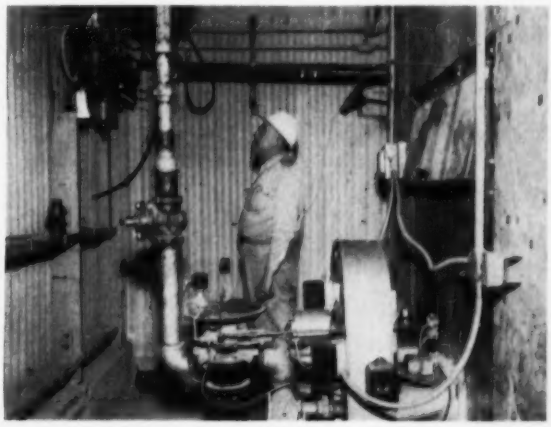
14. INSPECTOR CHECKS MATS to dress up any minor imperfections after the units leave the casting machine and before they enter the curing chamber (rear). Elapsed time between casting and start of curing process is only about 4 min.



15. MATS PASS THROUGH KILN in curing process. They enter on the upper level, and, at the far end of the 344-ft-long chamber, the conveyor swings them down to reverse direction and carries them out on the lower level shown here.

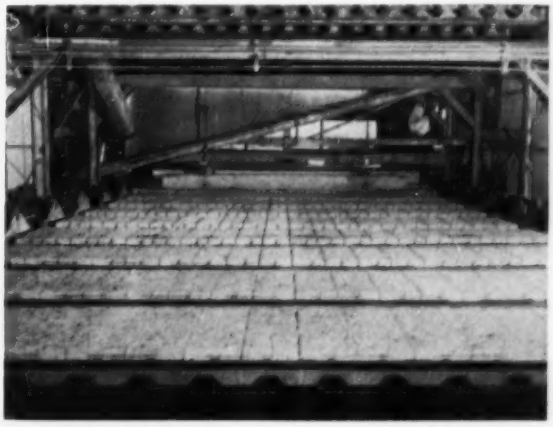


16. BOILER MAKES STEAM that automatically is injected into kiln in controlled amounts to insure proper curing. This single 150-hp Superior boiler makes all steam needed.



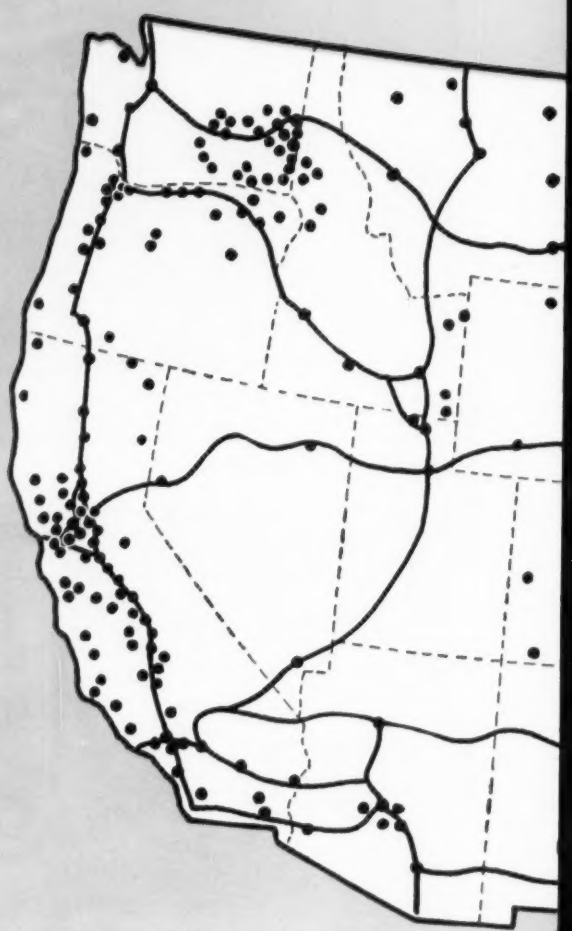
17. FURNACES HEAT KILN for controlled curing of mats. Five of these Johnson gas-fired 2,700,000-Btu heaters supply hot air to raise kiln temperature to a maximum 200 deg.

18. SAFETY-WIRE GUARDS CRADLES as they carry the mats through the curing kiln. If the cradle tilts or skews enough to touch the wire, the conveyor automatically stops.



19. MATS PROCEED TO UNLOADING STATION after 1-hr 50-min trip through curing kiln whose temperature increased gradually from entrance and exit points to 200 deg at far end.

continued on page 110



Caterpillar Dealer sales and service along the Interstate Highway System

Write today for free booklet, "The Road Ahead," with full details of the Federal-Aid Highway program.

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Please send me_____ copies of "The Road Ahead."

Name_____

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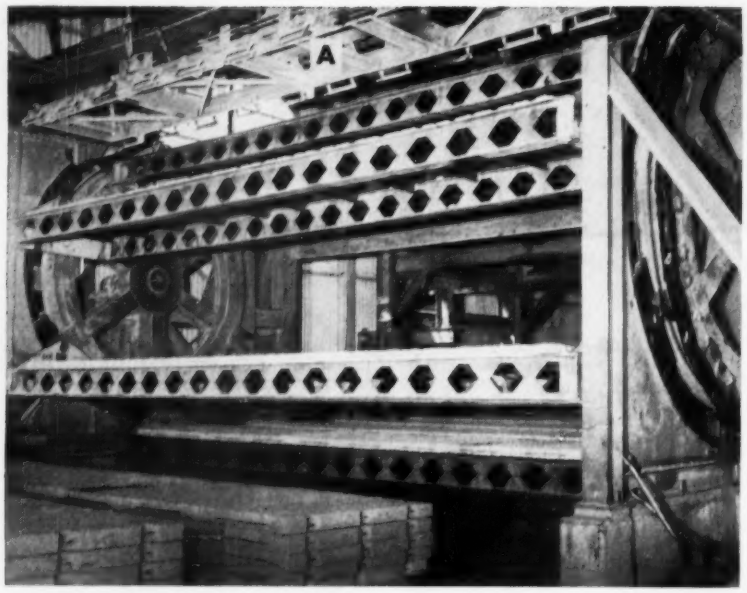
CATERPILLAR-ONE GOAL

ONE GOAL... To concentrate the capabilities, resources and experience of our people and of the world-wide Caterpillar Dealer organization on the design, manufacture, distribution and service of job-tested heavy equipment....

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

continued from page 104

Handling The Mats Is Well Mechanized



20. **CONVEYOR REVERSES DIRECTION** at drive end where handling frame (A), suspended from Universal bridge crane, will unload mat from pallet. Frame carries small compressor to power air-actuated fingers that hook onto edge wires of articulate mat.

21. **BRIDGE CRANE LOWERS MAT,** still held by lifting frame, on to one of a series of tram cars for later removal to field storage. At this stage, mat's concrete has 240-psi flexural strength, which rises to 450-500 psi in seven days.

22. **SPECIAL CARRIER HAULS MATS** to field storage and loading dock. With Model C Tournapull prime mover, carrier designed and built by Army Engineers handles stack of 13 mats. Mats, 3 in. thick, measure 4x25 ft and weigh 3,300 lb each.

POWER LINES ALONG THE POTOMAC ARE PUT TO BED . . . "*IN THE DRY*"!

These four pipelines, running under the Potomac River, carry electrical transmission lines from Potomac Electric Power Company's Generating Station (seen in background) to Blue Plains, Washington, D. C.

To effect their connection to a substation, H. L. Gentry Construction Co., Washington, preferred to work in a dry trench, predrained by Moretrench Wellpoint Equipment. Fourteen feet of water in layered sand and gravel were handled with no trouble at all. Sheeting was eliminated.

Count on savings in time and money (and a smoothly-operating job) when you start with Moretrench – in the dry.

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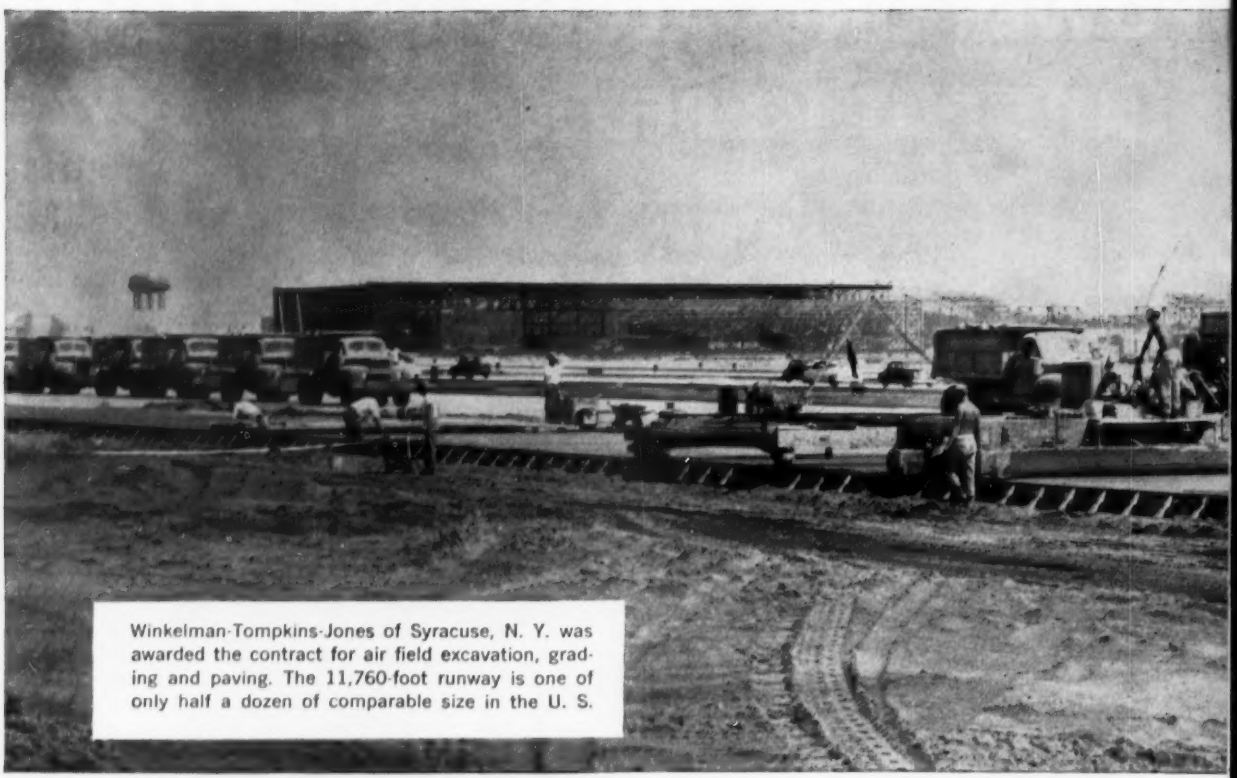

Winkelman-Tompkins-Jones of Syracuse, N. Y. was awarded the contract for air field excavation, grading and paving. The 11,760-foot runway is one of only half a dozen of comparable size in the U. S.

Gulf Products keep equipment rolling at

At Plattsburgh, New York, one of the most historic posts of the U. S. Army is being transformed into an air base for B-47 medium bombers. In addition to air field grading and paving, this multi-million dollar project includes construction of hangars, dormitories, mess halls, administration buildings and related facilities.

Air field grading alone has involved excavation of more than 4½ million cubic yards—and more than ½ million cubic yards of concrete will be

Parking apron extensions are being built by Bero Construction Company of Buffalo, N. Y. Bero is one of many leading contractors who use Gulf petroleum products exclusively.

THE FINEST PETROLEUM

and Fine Service Plattsburgh Air Force Base

poured in paving the runway, taxiways and parking apron. The runway will be a single concrete strip, 11,760 feet long, 300 feet wide and 14 inches thick, specially designed to take the 100,000 pound dual wheel loads of B-47's. Taxiways and parking apron will also be king-size.

Tight schedules must be maintained on this huge project—there's no time for costly mechanical delays. That's why *90%* of the petroleum products used by *all* contractors on this job are Gulf products. Gulf quality fuels and lubricants insure top engine performance, and close-at-hand distribution points provide prompt delivery.

Let Gulf serve *you* on your next job. Write today for your copy of "Gulf and Your Business" . . . and for your maintenance crew, get a copy of Gulf's revised lubrication and maintenance manual "Contractors' Guide."

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STANDS OUT ON THE TOUGH JOBS!

. . . TROJAN owners never hesitate to tackle the tough jobs! On difficult landclearing, digging in rocky, dry soils or working with extra heavy materials they know that the power, stamina and balanced design of their machines will always permit an honest day's work . . . So many "extras" are standard with TROJAN and so many useful operating features are built into every machine that we'll gladly demonstrate against any comparable model — any place and any time . . . Make a date with your TROJAN distributor!

EVER WORK IN MOIST SAND? . . . Look how this TROJAN heaps the bucket yet remains perfectly stable without any tendency to tip at any point in the lifting cycle . . . Big tires give full traction and flotation to work at high speeds.

Check This List of Important TROJAN Features

- Reverse Curve Safety Arms
- Straight Line Horizontal Thrust
- Independent Bucket Action
- Low Load Carrying Position
- Allison Torqmatic Transmission
- Detroit Timken Full-Floating Axles
- GM Diesel Engine Available
- Self-Centering Finger Tip Controls
- Box Welded Frames
- No Stopping to Shift
- Foot Clutch Eliminated
- Shift Easily at Full Throttle
- Fastest Time Cycle
- Standard 90" Bucket Spans Wheels
- Bucket Position Indicator

TROJAN | **TRACTOR SHOVELS**

YALE & TOWNE | 2 & 4 Wheel Drive Front-End Loaders

AD NO. 44-83

CONTRACTORS MACHINERY DIV., THE YALE & TOWNE MANUFACTURING COMPANY, BATAVIA, NEW YORK; SAN LEANDRO, CALIFORNIA

FAULTING ROCK on water diversion tunnel for $252-million Trinity River Project in California prompted contractor Gates & Fox to work up two methods for speeding work: first is a method for placing crown-supporting ribs; second, a means of anchoring ribs.

New Ideas Speed Tunnel Bracing

TWO NEW METHODS for stepping up placing of steel ribs on a rock tunnel job in California owe their birth to tough rock conditions. Dreamed up during mining of a water diversion tunnel for the $252-million Trinity Dam project, they are:

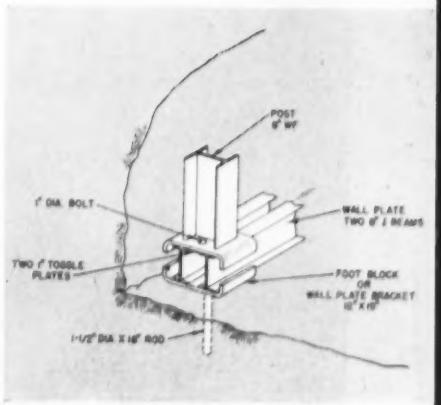
- A sure-footed method for anchoring the ribs to the tunnel floor that prevents them from shifting under heavy overburden or during blasting.
- A method for placing pre-assembled, crown-supporting ribs with a minimum of hand labor.

Both methods were worked out by Kirk H. Fox, a partner in the Gates & Fox Co. of Burlingame, Calif., tunnel contractor, to speed mining operations when heavily faulting rock was encountered on the job.

Actually, when the contractor landed the $1.4-million job of pushing 2,280 ft of tunnel through a huge knob of Andesite rock for the dam, it expected little more than a normal rock job requiring normal rock-mining methods.

Major dimensions of the tunnel included an upstream opening of 50-ft dia tapering to 34 ft at a depth of 50 ft, with a finished dia of 28 ft after placing of concrete lining. The Bureau of Reclamation estimated a total of 117,000 yd of material would have to be removed from the portal areas; some 80,000 yd of rock from inside the tunnel; and, about 1,000,000 lb of steel would be needed for crown support.

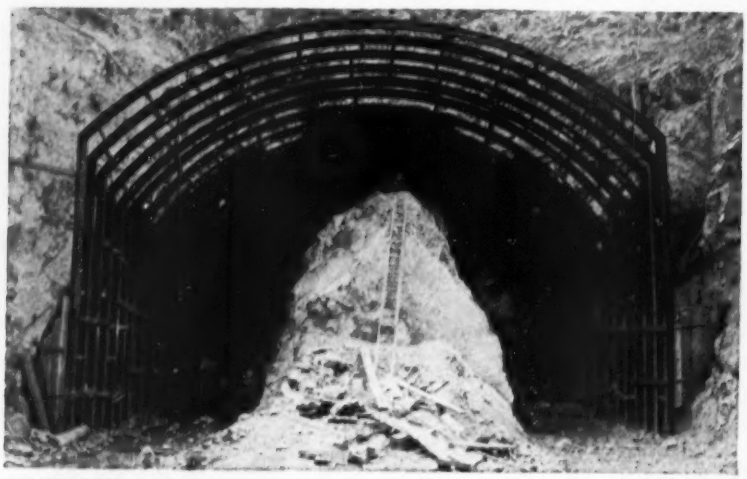
But neither the contractor nor the bureau figured on heavy faulting of the Andesite rock that began



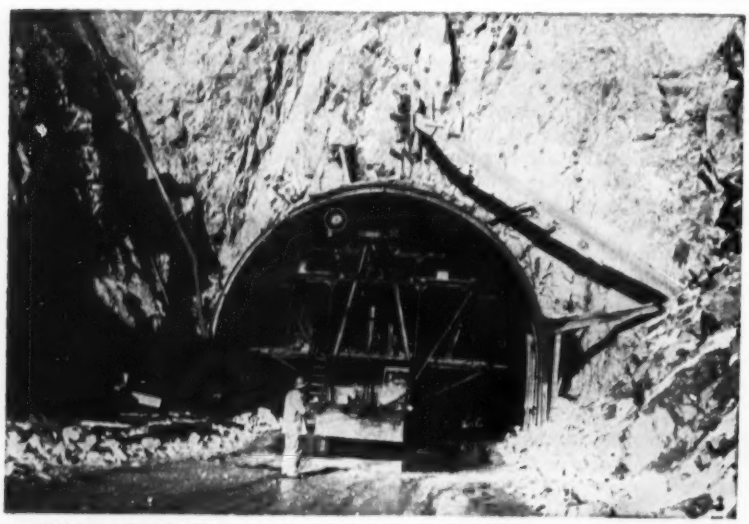
SILL AND TOADSTOOL is what contractor calls new type foot block for tunnel steel sets.

continued on next page

DAM PORTALS required nearly 100% more excavation than Bureau of Reclamation engineers originally had estimated due to heavy faulting of Andesite rock encountered in knob.



CONTRACTOR MINED two side drifts for first 50 ft of tunneling leaving a center pillar. This permitted early placement of steel ribs and eliminated need for a special jumbo.



MUCKING AND DRILLING equipment is used alternately between both the tunnel's headings to keep work going simultaneously from both faces. Jumbo moves out downstream portal.

during clearing of the portal areas. It was to more than double the estimates of material to be removed as well as double the steel needed for the job. Though the contractor would be paid for extra excavation and material needed, the job still presented tunneling problems that Fox's newly developed methods would help overcome.

At the portals the contractor mined two side drifts leaving a center pillar in place. This permitted placing of steel ribs to support heavily fracturing overburden without having to build a special drill platform on jumbos just for the initial heading.

Once portals were cleared, mining became full face. Inverts were left until tunnel completion so that tunneling and mucking equipment would have a road over which to pass.

Drilling

To drill blast holes, the contractor uses a three-deck jumbo mounted on a 10-wheel Crane crane-carrier. Five to six jackleg drills, including the new Atlas Copco BBC-22 automatic leg-retracting Lion, are used on the top deck to drill crown holes. Eight standard Gardner-Denver 93 drifters on hydraulic jibs are positioned on other decks of the jumbo. Drills all are equipped with 1½-in. and 1⅝-in. Sandvik Coromant detachable bits provided by Atlas Copco Pacific.

Gates & Fox employs a 150-man crew on a three-shift, six-day basis for the work. Mining is carried on simultaneously both on upstream and downstream headings with drilling and mucking equipment being alternated between the two.

A total of 90 holes are drilled per round. They are drilled to an 8-ft depth to produce an average of 28.4 yd of rock per ft of advance, or 230 yd per round. Six shots are fired every 24-hr period.

Most of the blasting powder used in DuPont's Gelex No. 2 at a rate of about 3½ lb for each yd of rock blasted. Delays are designed so that a central core pulls out first during the shot.

Mucking of fractured rock is by 4-yd Koehring Dumptors and Eimco muckers.

Placing Foot Blocks

After each 28 ft advance, Fox's method for anchoring crown-sup-

Report from Texas contractor on the NEW CAT* No. 955 TRAXCAVATOR

"We really like it. It does a heap of work well on many different types of jobs."

Jack Crea, Crea Bros., San Antonio, Texas

Twenty miles west of Austin, Crea Bros. are rebuilding 7 miles of farm-to-market road. Among the firm's Caterpillar equipment, there's this new 70 HP No. 955 Traxcavator* with 1½-yard bucket. Handling rock, gravel and cement, it's tearing out an old culvert for replacement to widen the road. Because of its versatility, it's kept busy 10 hours a day, 6 days a week, on many different types of jobs from excavating to loading.

The new No. 955 is proving a highly productive machine on operations all over the country. Here are some reasons why:

1. 40° bucket tilt-back at ground level assures large loads every pass.

2. Perfect balance of weight, power and capacity keeps the full length of the track on the ground even with a heaped load.

3. New oil-type clutch cuts costs two ways. Clutch adjustment, while easy, is seldom required. Plate replacement is often unnecessary even at engine overhaul.

4. Modern hydraulic system insures delivery of full volume and pressure of oil for thousands of hours. Filter located for easy replacement of element.

5. Pilot-house visibility provides excellent view of all bucket positions. All controls in easy reach—bucket control a one-hand operation.

6. Plenty of power to "bury" the bucket also provides fast lifting and positive dumping under all load conditions.

7. In-the-seat starting with choice of 6-volt electric starting for starting engine or 24-volt direct electric starting.

Your Caterpillar Dealer is a source of fast, dependable service and reliable information. See him for complete facts about the new No. 955!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar, Cat and Traxcavator are Registered Trademarks

USE CAT EQUIPMENT FOR HIGH-PROFIT PRODUCTION

For dependable operation

Gar Wood-St. Paul hoists operate through shift after shift with less maintenance attention. Time-tested hydraulic system has a built-in oil reservoir that eliminates pump starving. Simplified construction means smoother operation, easier servicing. Hoists are matched with a full line of stress-tested dump bodies.

GAR WOOD

PLANTS IN WAYNE AND

on round-the-clock shifts

go GarWood

Today's tight construction schedules demand equipment with maximum dependability. That's why production reports on grueling "round-the-clock" shifts are being watched with great interest. On jobs like this, Gar Wood dependability is paying off big . . . production is high with only minimum time out for maintenance!

Gar Wood's dependability is the result of advanced engineering from the ground up. Every part is designed for the specific function it must perform . . . designed to give you "round-the-clock" dependability. For more information, contact your Gar Wood construction machinery dealer or truck equipment distributor. Or, write direct to Customer Service Dept., Gar Wood Industries, Inc., Wayne, Michigan.

With Gar Wood "75" excavators there's less operator fatigue on long shifts. Direct manual controls retain true "feel". . . are located for instant control with less effort. Drum clutches are power actuated . . . no pressure is needed to keep clutch engaged, and release is positive. Power steering increases maneuverability.

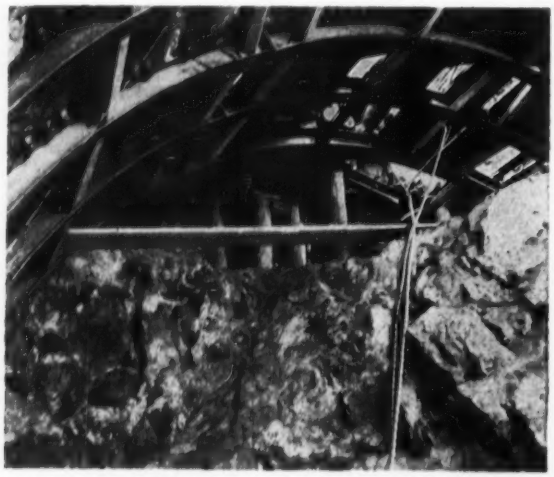
Gar Wood Tipdozers are matched to the power and stamina of Euclid TC-12 Tractors. Hammerhead-type push beams provide maximum rigidity against side thrusts. Hardened steel pins and bushings mean longer life. Gar Wood's hydraulic unit gives operator instant control of Tipdozer blade. Hydraulic pump, valve and lines are completely enclosed and protected.

Gar Wood-Buckeye ditchers are known for their ability to stay on the job. From the ground up they're designed to dig ditch . . . each assembly is engineered for its specific function. Servicing is quick and easy because of Buckeye's unit construction, parts interchangeability, and "Quick Change" rooter bits.

INDUSTRIES, INC. Wayne, Michigan

YPSILANTI, MICH.; FINDLAY, OHIO; MATTOON, Ill.; RICHMOND, CALIF.

DRIFTERS WORK from the cut deck of the jumbo. Contractor fires six rounds every 24-hr period, utilizing 8-ft deep holes.



HEAVY STEEL FRAMEWORK was required in the tunnel due to heavy fracturing of Andesite rock formation.

DETACHABLE ROCK BITS are sharpened on the jobsite with a standard bench-type bit grinder. Atlas Copco bits are used exclusively.

porting ribs to the tunnel floor is put to work. Fox calls the foot-block method the "sill and toadstool." This consists of a continuous wall plate that is formed by locking together two lengths of 8-in. I-beams with toggle plates and special bracket plates (see diagram). These sections are locked to the tunnel floor by 18-in.-long steel rods of 1½-in. dia. Foot plates are positioned on the floor beside both tunnel walls for the length of the heading.

Purpose of the unusual sill and toadstool is to give steel framework a solid footing. It also enables ribs to withstand lateral pressures from the fractured rock, and prevents rib movement during tunnel face and later invert blasting. Inverts will be mined when initial tunneling is completed.

Placing Rib Framework

Steel ribs on 2, 4, and 6-ft centers next are placed to support tunnel crown. Fox's method for preassembling the ribs and setting them with a minimum of hand labor enters the picture at this phase.

Four-piece rib sections totaling 69 ft in length are assembled on the tunnel floor behind the jumbo. Once assembled the full rib is lifted by a mobile crane (Pitman Hydra-Lift boom) onto a special, wheel-mounted carrier that rides on rails on top of the crown deck of the jumbo. Once there, the rib section is rolled into position in front of the jumbo and raised into place by hydraulic jacks. The ribs then are bolted to the foot block and to previously placed ribs by cross struts.

General foreman Robert Richardson devised a good method for dry packing irregularities behind ribs and lagging plates (used at the crown). Crushed gravel is stockpiled inside the tunnel. A truck loads gravel into a hopper. An 18-in. wide conveyor belt carries the gravel from the hopper up 32 ft to a second hopper near the tunnel crown that mounts a swivel-based 6-in.-dia blow pipe.

Dry-Packing Behind Ribs

Three compressors teamed together deliver 2,000 cfm of air through a 2-in. line to the main pipe. Air enters through a coupling adjacent the second hopper after first passing through a fixed baffle plate between the air inlet and hopper outlet to increase its velocity. By this means the packing is forced into voids behind ribs.

3 Differences that aren't in the policy

All Workmen's Compensation and Public Liability policies read pretty much alike. The difference shows up on the job.

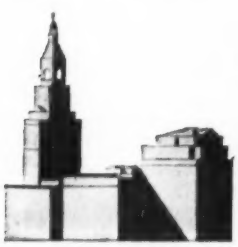
1. Effective Accident Control: When you're insured with The Travelers, expert safety engineers are available to help you prevent accidents *before* they happen. (Over the years The Travelers has spent more than $100 million on accident and fire prevention and inspection services.)

2. Prompt Claim Service: If you *do* have a claim, one of the 251 Travelers claim locations from coast to coast gives you prompt *on-the-spot* service. The burden of suits and settlements is off your shoulders. You're free to go ahead with your project.

3. Complete Employee Rehabilitation Program: The Travelers complete Employee Rehabilitation Program assures your people the best medical care. Everything that *can* be done *is* done to restore injured workers to good health.

In these days of close profit margins and greater risks, these differences are well worth considering. Call your Travelers agent or broker for full details.

The Travelers service for contractors also includes: *Contractors' Bond Service* with speed and know-how. *Contractors' Equipment Floaters* and *Builders' Risk* insurance serviced by a nationwide claim organization that can give you prompt attention anywhere.



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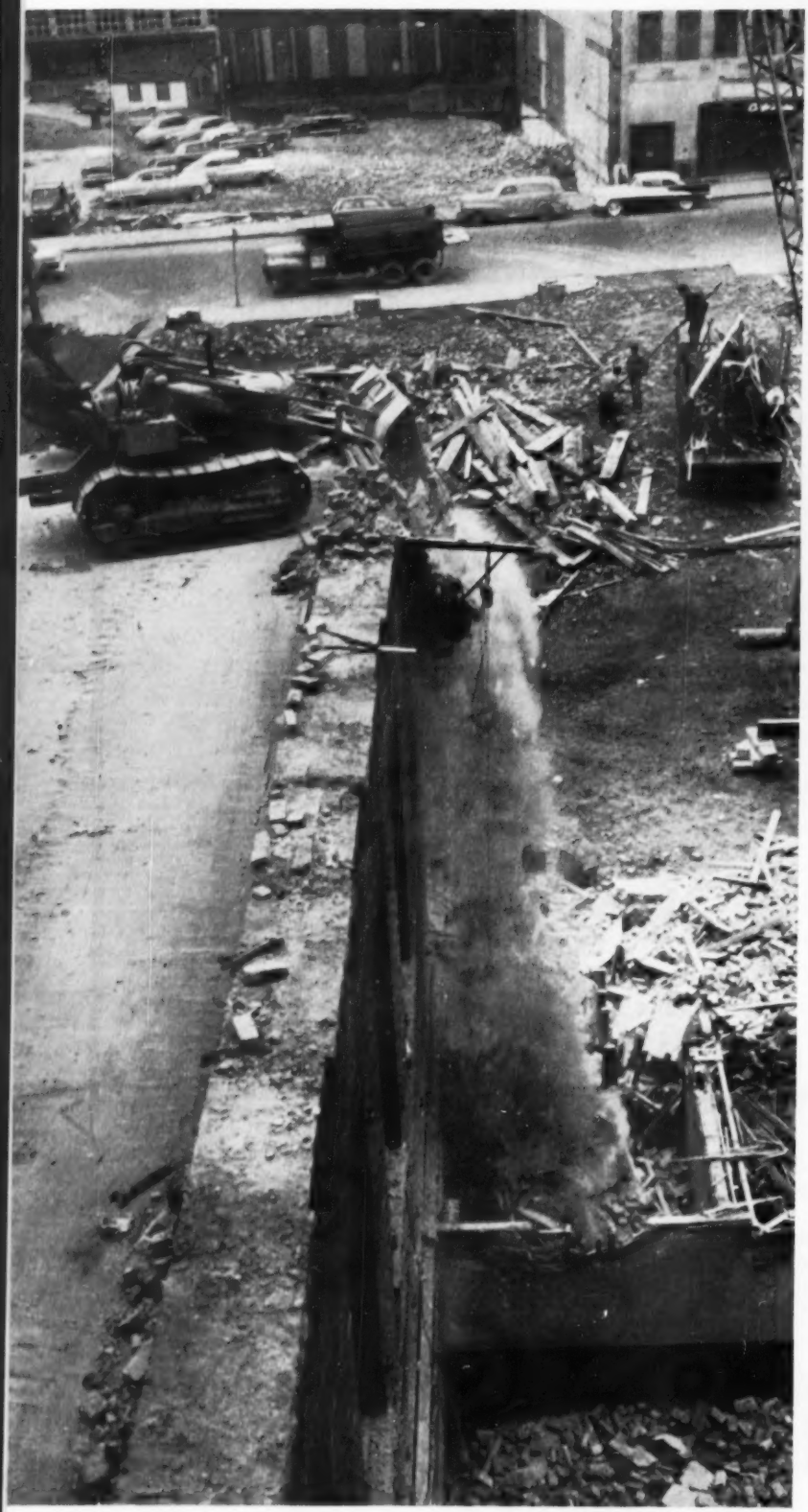

FITTED with a front-end bucket, an Oliver OC-3 pushes rubble over the side of a building making way for the multi-million-dollar Fitzgerald Expressway.

In San Francisco

CRANE lifts a John Deere 420 tractor to the rooftop of a six-story hotel.

Tractors

TRACTORS ON ROOFTOPS are becoming as much a part of the wrecking scene as the iron ball. Wreckers find them great labor-saving devices; some contractors claim saving of up to $2,000 weekly on their demolition job.

Contractors use them in a variety of ways. Fitted with front-end loaders, they scoop up rubble and dump it into chutes or over the side of the building. With bulldozer blades attached, the tractors push rubble over the building's side or into chutes. Lash a cable to them and they become handy for pulling over columns or beams. Both rubber-tired and crawler types move easily over rubble, debris, and exposed beams.

Tractors have been used for this work before. But they are growing in popularity because manufacturers are making them smaller,

And in New York City

WORKMAN dwarfs tiny Mity Kat crawler tractor being used to push rubble into chutes. Little tractor proved big labor-saver to contractor razing midtown hotel.

SOLID rubber tires carry Hough Payloader moving rubble on Park Avenue

TRACTOR on Wall Street job is a John Deere 420 fitted with a dozer blade.

Crawl Across the Rooftops

lighter, and more versatile. Floors can carry them easily, and a crane can lift them to almost any desired height with little trouble.

Are they dangerous? Not if you guard against putting too heavy a tractor on the floor. First make certain of what weight the floor will bear, then select a piece of equipment light enough to do the job. Finally, lift it to where you want to use it and go to work.

Who's Using Them

Here are some ways contractors have been putting the tractors to work. In Los Angeles, Emsco Concrete Cutting Co., razing the six-story Sacramento Hotel lifted two John Deere 420 crawler-type tractors with buckets 85 ft to the roof.

They push floor and wall rubble into chutes that carry the debris to the street below. Savings in labor on this job are amounting to more than $1,000 weekly.

On a demolition job at New York's Wall Street section, two more John Deere 420's also fitted with blade and bucket are adding $1,400 weekly to job profits.

Lipsett, Inc., New York demolition contractor, uses tractors extensively for this type of work. In wrecking New York's Margerite Hotel to make way for the new Union Carbide and Carbon Building, the contractor uses a ½-yd Hough Payloader to lift and carry rubble to chutes. Lipsett fitted the tractor with solid rubber tires to prevent punctures when the rig moves over jagged ends of steel beams. (Wheel barrows, too, are fitted with solid rubber tires.) On this job, a spokesman said "the tractor paid for itself in a couple of weeks."

During demolition of an apartment building to make way for the all bronze Seagrams Building in New York City, Lipsett employed two Mity Kats, light crawler tractors fitted with bulldozer blades. They pushed rubble into chutes and rammed concrete off fireproofed steel columns, internal beams, and spandrels.

Uses Two Tractors

And up Boston way, Bay City Wrecking Co., demolishing buildings to pave the way for the multi-million-dollar Fitzgerald Expressway, fitted an Oliver OC-33 crawler-tractor and an International HD-21 with front-end buckets and used the rigs to push rubble over the building's side. The contractors here claimed both machines paid for themselves within a month's time.

D9's and D8's show peak production on Olin Mathieson's $95-million Ohio plant!

When Allegheny Contracting Industries, Inc., Pittsburgh, Pa., took on an 8,500,000 cubic yard earthmoving contract for Olin Mathieson's new $95-million aluminum plant near Hannibal, Ohio, this construction firm brought in its big team of torque converter-equipped Caterpillar D9 and D8 Tractors to handle the giant sized "landscaping" job.

Using the powerful D9's (currently 320 flywheel hp) and D8's as pushers, one hour and weight study taken of five Cat DW21 Traetors showed an average hourly production to be 150 bank cubic yards per hour per machine on a 1500-ft. one-way haul.

"We give the torque converter a lot of credit for our high-production performance," says Allegheny's Vice-President W. J. Parish. "We're handling loose sand and gravel . . . and the going can get mighty rough at times. The weather has been against us on this job — yet our torque converter-equipped machines do not 'dig in' on a hard pull."

The torque converter drive of the Cat-Built Tractors, which standardizes on Twin Disc Torque Converter components, matches the machine's output torque to the load, regardless of operating conditions . . . cushions out shocks and vibrations to reduce parts wear and breakage . . . minimizes or eliminates gear-shifting . . . provides accurate load control . . . and improves over-all flotation.

Specify a torque converter in your next Caterpillar D9 or D8 Tractor. Enjoy the benefits of greater productivity — bigger profits.

Twin Disc Clutch Company, Racine, Wisconsin; Hydraulic Division, Rockford, Illinois.

This torque converter-equipped Cat D9 Tractor is push-loading DW21 Tractors and Scrapers at peak-level performance on Olin Mathieson's giant aluminum plant site. Twin Disc components are standard for the D9's torque converter drive.

TWIN DISC
CLUTCHES AND HYDRAULIC DRIVES

TWIN DISC
Torque Converters

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin • HYDRAULIC DIVISION, Rockford, Illinois
Branches or Sales Engineering Offices: Cleveland • Dallas • Detroit • Los Angeles • Newark • New Orleans • Tulsa

Heaped loads up to 25 cu. yds. were easily handled in fast time by this DW21-No. 470 Lowbowl Scraper for L. G. Arnold, Inc. Other Caterpillar-built units in the company's line-up include a D9 used as pusher; one non-current DW21; two D8s; two No. 12s; one D6 with tamper; one D7 with Bulldozer and a No. 80 Scraper.

"OUTPRODUCED BY FAR ANY OTHER MACHINES ON THIS JOB"

Phil Dudenhoefer, grade foreman, L. G. Arnold, Inc., Eau Claire, Wisconsin

CAT* Lowbowl Scraper, push loaded by a D9, set the following pace on relocation of U. S. 53, Wisconsin:

1. Averaged 12 to 15 minutes a trip with heaped loads on a three-mile round-trip haul.

2. Loaded sandy gravel in 70 seconds and topsoil in 45 seconds.

Here's more proof that Caterpillar Lowbowl Scraper design really pays off on the job. The proof comes from F. L. Carr, Vice-President, and Phil Dudenhoefer, grade foreman, of L. G. Arnold, Inc.

Quoting F. L. Carr: "The new DW21 and D9 pusher have more than lived up to all of our expectations. The lowbowl design of the new scraper has even improved the easy loading feature of Caterpillar-built hauling equipment."

Quoting Phil Dudenhoefer: "In my 28 years in this business, I've seen all sorts of earthmoving machines, and Caterpillar beats them all. As grade foreman, I've got both feet right down in the dirt where I observe and record the output and performance of every machine. I'll say this: the DW21 and No. 470 Lowbowl Scraper with the D9 pushing outproduced by far any other machines on this job!"

The job: The relocation of about 10 miles of U. S. 53 between Eau Claire and Chippewa Falls, which involved the handling of 78,059 cu. yd. of borrow (sandy gravel), 42,901 cu. yd. of unclassified and 93,272 cu. yd. of overburden (topsoil). The Caterpillar DW21-No. 470 Lowbowl Scraper (struck capacity 18 cu. yd.), carrying heaped loads up to 25 cu. yd., made four trips an hour on a three-mile round-trip haul. Loading time, with the D9 pushing, averaged 70 seconds for sandy gravel and 45 seconds for topsoil.

On job after job, under varying conditions, the Cat Lowbowl Scraper is showing its heels to other earthmovers. Your Caterpillar Dealer, who backs you with prompt service, will be glad to show you *facts* and *figures* comparing its performance with other units.

For *proof* that it will pay you to put DW21-No. 470 Lowbowl Scrapers on your job, see him today!

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

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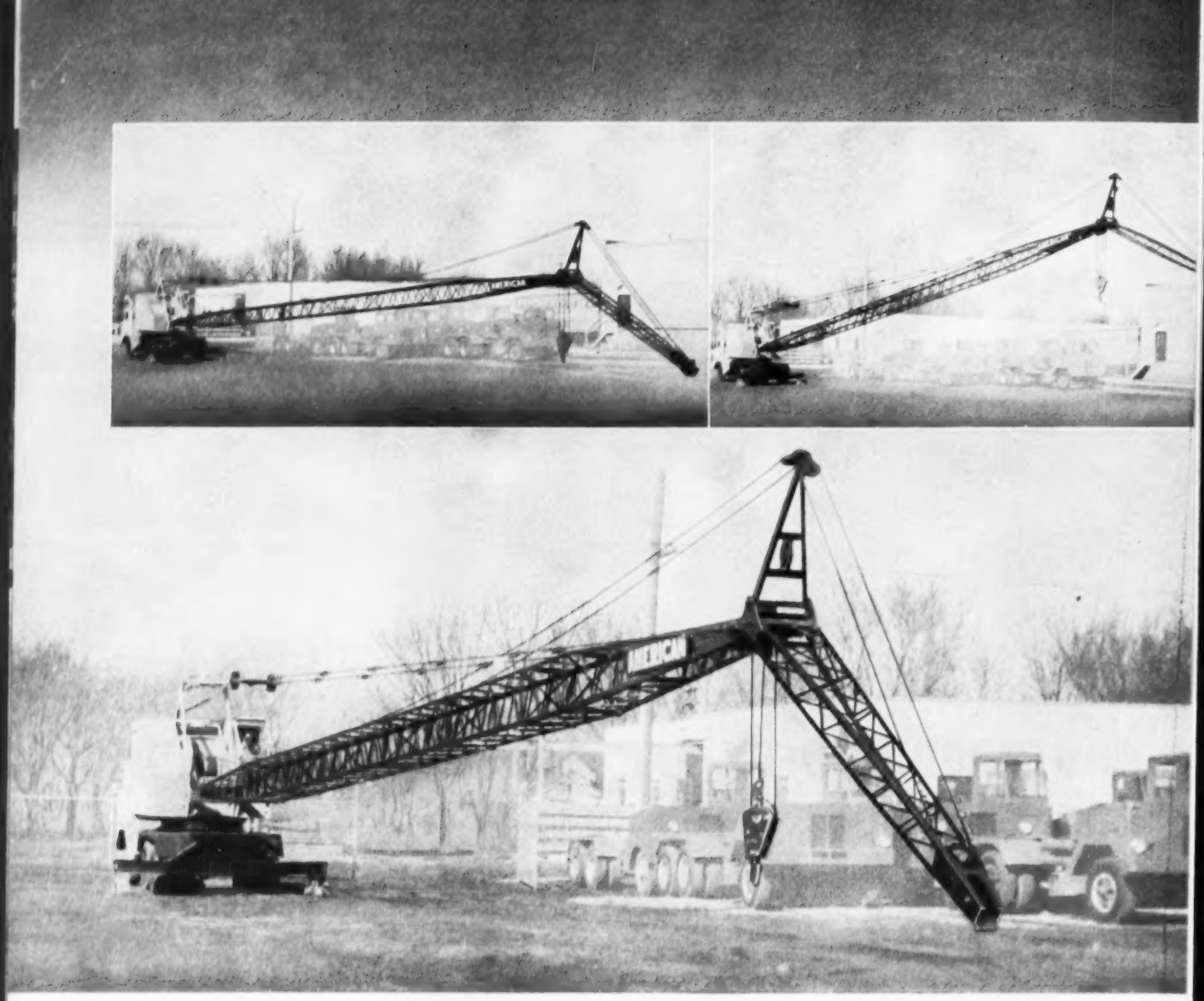
WANTED— THE HARD WORK



AMERICAN 12½-TON CRANE LIFTS 100-FOOT BOOM WITHOUT HELP!

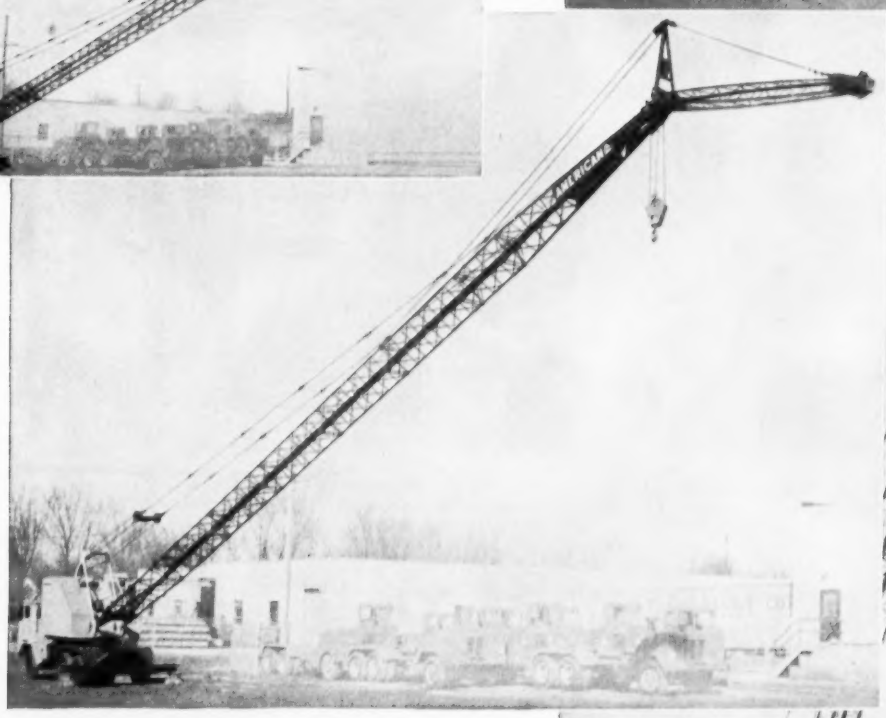
Here's proof of American Cranes' lifting capacity—a stock model 100 Series Truck Crane lifting 100 feet of boom right from the ground *without help—without hesitation!*

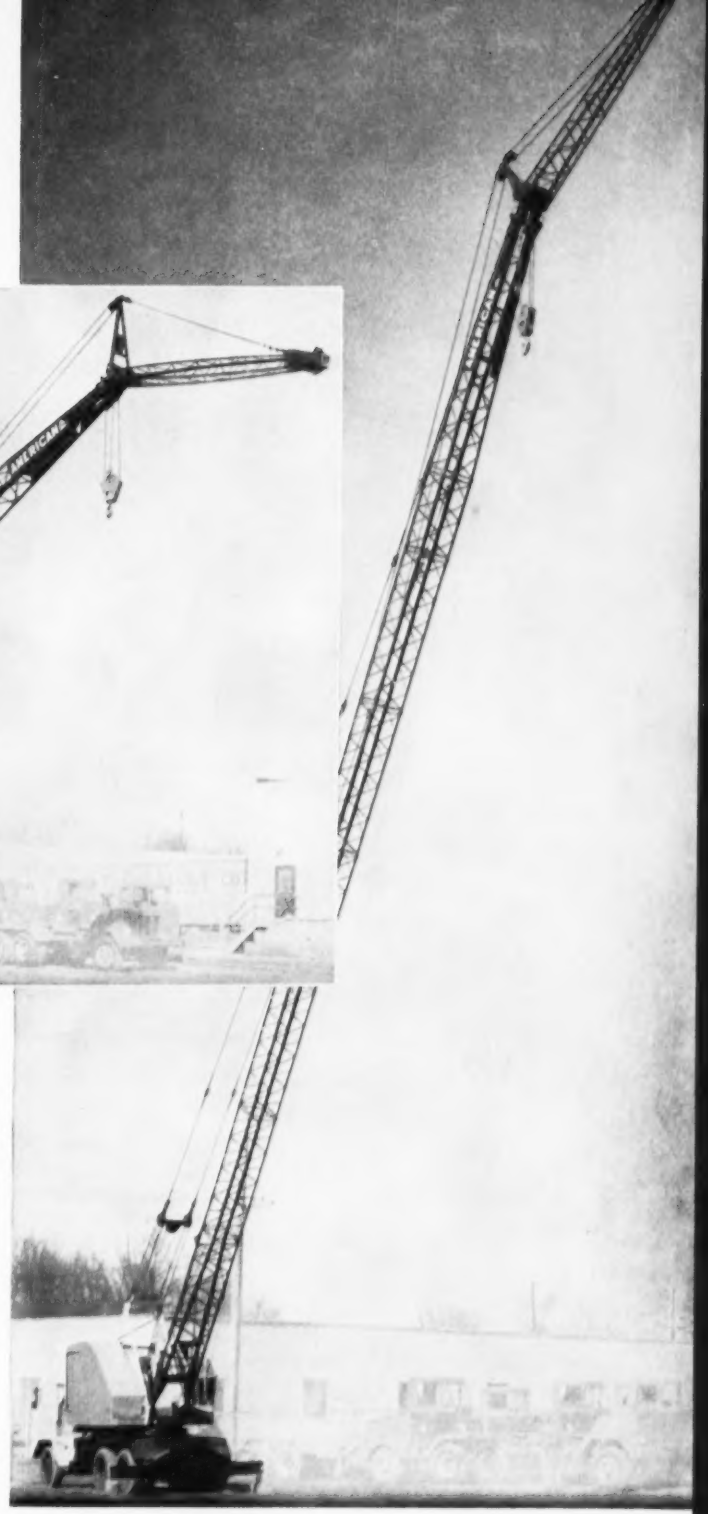
In designing this new 12½-ton capacity crane, American engineers have achieved a perfect combination of machine balance, gantry design and precision boom hoist mechanism. This exacting match permits the 100 Series to lift as much as 85 feet of boom—15 feet of jib with ease and perfect control.

The boom hoist's positive power, controlled with an easily operated heavy duty clutch, raises the boom smoothly and quietly. American's optional, overrunning sprag clutch provides 100% boom control—there's not an inch of drop when the boom starts down. The exceptional balance of the 100 Series is demonstrated by the fact that additional counterweight isn't required, even when lifting this long boom!

A new concept in crane design is offered in the tough, lower-cost American 100 Series crawler and truck cranes. It's a concept based on maximum workability, peak efficiency at consistently low operating and upkeep costs. Actual job performance records have *proved this statement!* Your American Distributor has complete facts on this amazing new crane that's available with any front, on crawlers and rubber, in ½-yard, 12½ and 15-ton capacities!

(Advertisement)





WITHOUT HELP, the American 100 Series lifts its 100-foot boom directly from the ground to working position. Precise boom control and exceptional stability give operators fast, accurate load spotting on every job. Highly mobile and maneuverable, the 100 Series can travel over most highways without stripping to meet road restrictions. On the job, it sets up for work almost automatically. The operator alone raises the gantry legs into position—the high gantry locks automatically. Simple, safe pin connections speed boom section assembly! At work, the 100 Series, equipped with a dragline, clamshell, backhoe, shovel or crane front, maintains a consistently high production pace at low operating cost. Dependable American crawler and truck mounted cranes are offered in capacities from ½-yard to 2 yards, 12½ to 50 tons lifting capacity.

FOR 75 YEARS, AMERICAN equipment has been the number one choice to work on the biggest, toughest projects in the world. They perform every type of job under all possible handicaps. Experience in this world-wide testing ground has given American engineers unequalled knowledge that is converted into the best, most complete crane line available. When you buy American, you get full advantage of three-quarters of a century of experience! See your American Distributor or write direct for information on the machine to do your job best.

AMERICAN HOIST

and Derrick Company

St. Paul 7, Minnesota

How the Contractor Qualifies . . .

NET WORTH is checked carefully. Besides funds to finance job, contractor needs assets to cover emergencies.

NEXT in importance is contractor's record on previous projects—especially those done under bonded contracts.

SURETY BONDS—Their Function,

Do you know the basic differences between bonds and insurance coverages?

Are the surety investigations of your qualifications fair and accurate?

Do you gain when you pay premiums for bonds that indemnify other parties?

THE FACT that bonds are issued by insurance companies rather than by banks or special credit companies contributes to a common misunderstanding among contractors of the nature of surety bonds and of the varying rights and obligations of the parties involved.

A surety bond can be considered a conditional promissory note. Like any guaranteed or endorsed note, a bond has three parties—the principal (contractor under a general contract and the subcontractor under a subcontract) corresponds to the maker of the note; the beneficiary (owner under a general contract and general contractor under a subcontract) is comparable to the payee; and the surety becomes the endorser. Unlike most insurance coverages, the principal must be in default before the surety becomes liable to pay under the provisions of a bond.

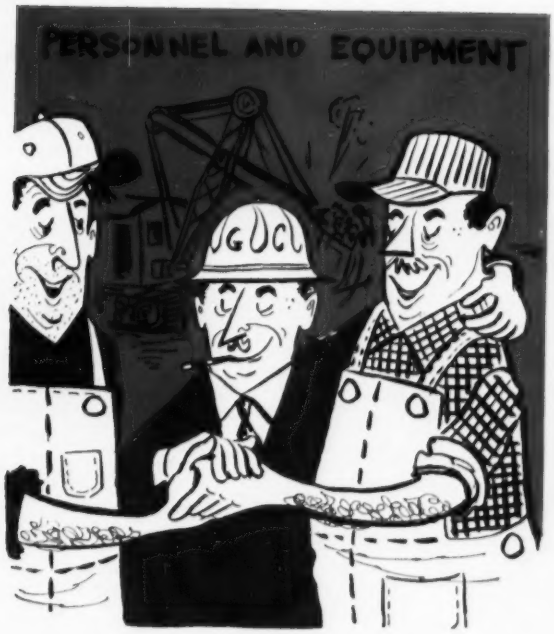
From the contractor's point of view, bonds are essentially credit obligations, and credit is the foundation of the United States economic structure. In most other countries, business credits are secured by deposits or guarantees made or arranged by banks or other financial institutions. In this country, such procedures would tend to tie up capital or result in excessive interest costs and service charges. The need for a more flexible and less costly method of securing performance guarantees and providing indemnity is filled by corporate suretyship.

How does a contractor qualify for bonds? To keep premiums at a relatively low level, while still showing a profit, underwriters must keep down losses. To do this, underwriters must make careful investigations to determine an applicant's qualifications for the various types of bonds. Generally speaking, these investigations center around three principal factors: **(1) the applicant's financial standing; (2) his past experience and current commitments; and (3) his personnel and equipment.**

The contractor's current net worth is by far the most important consideration, and many contractors are critical of the sureties' emphasis on this fact. Some claim that other qualifications, such as

EDITOR'S NOTE

Material for this article was gathered from a number of sources including interviews with surety experts, legal authorities, and officers of leading construction firms.



SURETIES *realize that successful completion of a job often depends upon a few key men, quality of equipment.*

Value, and Effect

experience, personnel, and large equipment inventories, are also important, but often overlooked. They also claim that this evaluation is too often based only on the contractor's "quick" net worth (the contractor's assets that can be quickly turned into negotiables minus his outstanding credits).

Many established contractors are critical of the extreme importance the sureties place on quick net worth for two reasons: (1) they believe that sureties neglect to place true value on past experience or the calibre of equipment and personnel; and (2) they say owners are willing to accept contractors or subcontractors regardless of their past experience because the sureties, in effect, recommend them by bonding them.

At a recent convention of the National Assn. of Surety Bond Producers, Rear Admiral R. H. Meade, chief of the Bureau of Yards and Docks, told the delegates that " . . . bonds give us some assurance that the low bidder is financially and technically qualified to do the work. We assume that the surety firm has investigated both points and wouldn't write the bond unless the bidder measured up on both counts."

At the same meeting, Brig. Gen. Walter K. Wilson, Jr., deputy chief of the Corp of Engineers, said, "The presence of a surety bond in a construction project gives persuasive indication to a contracting officer that the bidder possesses the financial means, the technical know-how, and the physical plant essential to successfully do a job."

Sureties say their investigations cover all aspects of a contractor's business. The sureties insist that in their investigation of the contractor's financial status they must go beyond his ability to meet payrolls or pay for materials or machinery. Because of the many risks inherent in construction, the sureties require the contractor to have enough current assets, in relation to his liabilities, to continue his job even though unexpected difficulties arise. These "unexpected difficulties" can include defaulting subs, bad weather, materials shortages, price increases, and a host of other dangers that a construction company faces from day to day.

Surety files indicate that many contractors who possess integrity and professional competence fail to achieve financial success because of administrative shortcomings. One of the main reasons for this, in the eyes of the sureties, is the contractor's failure to evaluate his current financial position in the light of current business practices; he neglects to make adequate provisions for capital financing to cover unforeseen contingencies and indirect costs.

The bonding companies also claim that the sufficiency of a contractor's working capital is dependent upon such circumstances as the volume of work he has on hand and the type of contract for which he requests bonds. A contractor with a proven record of integrity and ability would require less working capital as a credit risk than would a less experienced or less reliable one, they say. But the contractor would still require adequate working capital to meet emergencies.

To check a contractor's financial condition, the sureties require a current financial statement prepared by a certified public accountant that includes an up-to-date schedule of current assets and liabilities. This is generally supplemented by investigations of creditors (such as subs or suppliers used by the applicant on previous jobs) and by checks with such "friendly" sources as banks or local credit organizations.

A committee of surety officials and members of the American Institute of Accountants are at present trying to develop mutually acceptable standards of judgments of contractors' financial statements.

A contractor must have other attributes besides an adequate balance sheet in order to qualify for bonds. One of the most important is his record of past experience on jobs similar to the project for which he requests bonds. The bonding companies investigate the experience of the contractor on previous jobs, and, in some cases, they make special investigations of the bidder's qualifications to perform certain types of work.

Some contractors insist that sureties should depend more heavily on this type of investigation. They cite the case of the contractor who gets a bond only because his financial status is good. They also say that the bond companies rely

TORQMATIC shifts at full throttle– eases haulers out of muck and mire

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too heavily upon the closeness of the bids when determining whether or not to bond a contractor. And they charge that, if the low bid on a project is a considerable amount below the next bid, the contractor will often have trouble getting bonds.

The fact that a contractor has developed a new method of doing a job that may cut his costs, they say, usually is not considered by the surety. If the spread between the low bid and the next bid is abnormally large, this is often enough to disqualify the low bidder for a bond.

When this situation exists, most contractors would prefer that the surety seek competent and disinterested engineering advice as to the merits of the contractor's method before refusing to write a bond. On some projects the surety companies will make such an investigation, but on other jobs the low bidder may have trouble getting a bond.

Personnel Is Important

Physical circumstances and economic developments sometimes cause surety losses, but a check of any surety's files will show that most losses result through human failings. For this reason, one consideration in qualifying for bonds is the caliber and experience of the men in the contractor's organization. The sureties realize that in the construction industry the success or failure of a big job generally depends upon the performance and abilities of a few top-level men.

It is no secret to the sureties that well-qualified, top-flight construction personnel are expensive to keep on the payroll, especially between major projects. Therefore, the contractor who builds and keeps a competent staff — even through periods of relative inactivity—should be credited with better-than-average managerial ability.

The same cannot be said for the contractor who attempts to "buy" an organization of qualified people after he successfully has estimated a low bid. The investigation of the quality of personnel extends to the front office. Sureties investigate the history of partners and officers in a contractor's organization to see if they have had previous associations with defaulting contractors.

continued on next page

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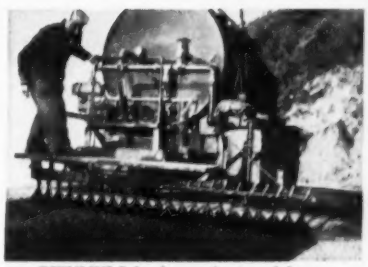

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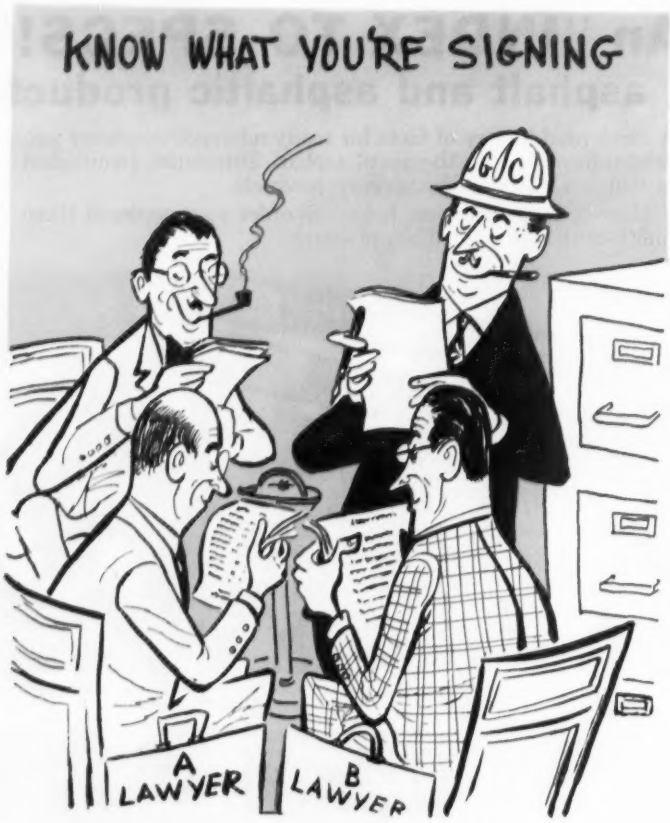

BOTH CONTRACTOR and owner need competent review before entering into agreement—not after it is signed.

Job Contract, Not Bond Form, Determines Your Liability

SURETY BONDS DIFFER from insurance in that bonds usually are not as standarized as are the various insurance coverages purchased by contractors.

The form of a bond rarely spells out in detail the specific liability of the principal or the surety. It is important to realize that the bond form the principals sign does not determine the agreement between the owner, the contractor, and the surety. Instead, the provisions of the bond are determined by the provisions of the construction contract, the specifications, and other documents that refer directly to the project under consideration.

Because this is true, it is important that all parties take pains to see that the construction documents express all the obligations and rights of both the contractor and the owner. There are several very important points that often are misinterpreted or overlooked by either the subcontractor, the contractor, or the sponsoring authority.

For this reason, before giving or accepting a bond the contractor should obtain the advice and review of legal counsel or of an experienced bonding agent. Experience proves that it is far better to let your attorney or bonding advisor protect your interest in advance of entering into a bonding

CHECK THESE POINTS

THE FORM of a bond rarely spells out in detail the specific liability of the contractor and the surety. Instead, the obligations of the contract and the requirements of the plans and the specifications usually are the controlling factors. What is omitted from the contract is automatically omitted from the coverage of the bond. For this reason, all parties to a bond should be careful to see that the following provisions are detailed in the contract:

SCOPE—Contract should specify the amount and general nature of the performance bonds and separate labor and material payment bonds. Care should be taken to see that unnecessary burdensome restrictions, limitations, or obligations are not included in the language of the contract. The obligee (owner under a general contract and the prime contractor under a subcontract) should reserve the right to specify the terms and to approve the form of any bonds required under the contract.

DEFAULT—Contract should detail how principal is to be considered in default; how he is to be given notice; and the time he has to remedy the situation. It should also include a provision for reimbursement to the obligee for excessive expenses, damages, or liability suffered by him by reason of default as well as by reason of lack of performance.

MODIFICATIONS — Contract should describe the manner in which changes in the contract, as well as in the nature and extent of the work, can be made. This should include the method of adding or deducting work from the original contract and the method of payment for such changes. Contract should expressly provide that such changes or modifications shall not release the surety under any bond previously given.

MECHANICS LIENS—Contract should obligate the principal to protect the owner and the real property involved from mechanics liens and encumbrances. The contract should provide that the contractor will discharge such liens and encumbrances according to law, or that he will provide the owner with funds to meet liens within a stated period of time after notice is given the contractor. (While creditors who might obtain such liens will normally file under the payment bond they might also file against the owner's property to embarrass the contractor or to exert pressure on him through the owner.)

STATUTORY REQUIREMENTS — Some performance bonds and many payment bonds are subject to statutory provisions. It is to the benefit of all parties to a bond to see that the contract meets these legal requirements. Otherwise the courts have the power to change the contract to meet local statutes.

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agreement. It is much more difficult to negotiate differences after bonds have been signed.

Many contractors fail to obtain a competent review of the form and the manner of execution of the bonds they give or accept. The bond form is generally a simple one, but carelessness in its execution can result in unnecessary court actions that might endanger the contractor's operations by tying up his capital.

Serious defects in the execution of bonds arise through unauthorized or incomplete signatures. Few contractors realize, for example, that the only persons who are legally authorized to sign the bond contract for an incorporated firm are the president or the vice president. Under most corporation bylaws, this authority cannot be delegated to a treasurer, secretary, or lesser official.

Surety bonds should always be stamped with the official corporate seal. When several copies of the bond are executed, all copies should be signed and sealed by all parties to the bond. As a general rule, all signatures should be acknowledged before a notary public, and he should affix his notarial acknowledgment form to each copy of the agreement. The authority of the executing officer for the surety should be evidenced by certified copies of his power of attorney. It is good business practice to attach a signed copy of the bond, the notary's acknowledgment, and the surety officer's authorization to each signed copy of the construction contract.

Some contractors who are careful to see that their rights are protected when they furnish an owner with bonds are less than careful when they accept bonds from their subcontractors. Besides adhering to the rules of execution outlined above, the contractor should see to it that the surety is furnished with a copy of the proposed subcontract so that the surety can draft the proper bond forms. Bonds given to the contractor by the subcontractor should describe in detail the work to be performed under the subcontract.

Another point to remember is that in the eyes of the law the general contract and the subcontract are two entirely different agreements. When the general contractor subs some of his work, he does not really reduce his obligations to the owner. By requiring subs to furnish payment and performance bonds the general contractor minimizes his risks, but he is not relieved of his over-all responsibility for the job.

Many general contractors believe that surety companies allow full credit, when determining a prime contractor's eligibility for bonds, for the aggregate amount of bonded subcontracts against the volume of non-bonded work. This is not the case. If it were true, it would follow that all a contractor would have to do to qualify for a bond would be to see to it that all his subcontractors furnished bonds. The facts are that the surety would refuse bonds to a contractor with inadequate capital financing.

Some performance bonds and many payment bonds are subject to state and federal laws. If bonds are not carefully prepared to meet statutory provisions, the parties to a bond may discover—in the event of trouble—that a court of law has the power to "reform" the bonds to comply with existing statutes. Changes made by the court might adversely affect either party to a bond. Especially when working in locales new to them, contractors should carefully investigate local legal requirements.

continued on next page

SURETY LOSSES HIGH

The volume of construction in 1956 reached an all-time high, but so did the number of building contractor failures, according to Warren N. Gaffney, general manager of the Surety Association of America. He told delegates to the convention of the National Association of Surety Bond Producers that failures for the past three years were 1,305 for 1954; 1,404 for 1955; and 1,843 for 1956.

Although all these contractor failures were not bonded, the contract bond loss nevertheless was $32 million for 1954 and $44 million for 1955. The 1956 losses have yet to be revealed.

Gaffney said that a major cause of contractor failures "is the destructive competition set off frequently by novices—the tyros—in the business." Other causes of contractor failures, according to Gaffney, are a failure on the part of the contractor to appraise correctly his financial status and the tendency of the contractor to over-extend himself.

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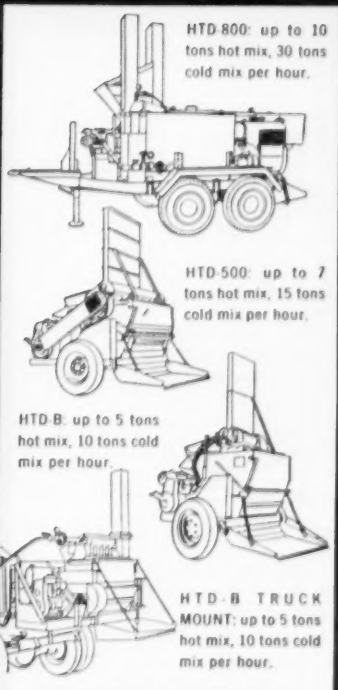

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Contract Price, Not the Bond, Measures Risks and Sets Rates

BOND PREMIUM RATES are based on underwriting experience, and they must be filed with and approved by each state insurance department.

Contractors have difficulty understanding why bond rates are based on the contract price rather than on the amount of the bond. The reason is simple: The amount of the bond merely is the limit of the surety's liability; the contract price measures and reflects the physical difficulties and financial risks involved in actual performance.

Suppose two friends (call them "A" and "B") engage the same contractor to build identical homes on adjoining plots of land at the same time and for the same contract price. For all practical purposes, the risks are the same.

"A", being familiar with the bonding requirements of such public owners as the federal government, requires separate performance and payment bonds, each for 50% of the contract price. "B", not being familiar with such precedents, requires each bond to be for 100% of the contract price.

Risk 25% of Job Cost

Experience has taught the sureties that the potential risk under the performance bond on a building job is probably only 20 to 25% of the contract price (this is the difference between the price the contractor quoted and what the owners would have to pay a successor to complete the job should the original builder default). Therefore, the maximum amount of the penalty of such bonds, when written at 50% of the contract price or more, has no practical effect on the risk to the surety.

As a result, if premiums were based on the penalty of the bond rather than on the contract price, it is obvious that "A" would be getting the same protection as "B" at half the cost. No state insurance department would approve such a rating system when experience shows that the probable risk to the surety does not exceed the amount of the bond accepted by "A". Accordingly, the premium must be based on the factor which truly reflects the performance risk, and that is the price charged by the contractor.

Final Price Sets Premiums

Another point to remember is that the original estimate made by the contractor and the final contract price are two different things. The contract price, on which premiums are computed, means the whole sum of money or other reimbursement that passes from the owner to the contractor when the final settlement between the two has been made. This excludes any bonus for "time" provisions of the contract, and it also deducts any penalty for "time."

If the sum of the final settlement between the owner and the contractor differs from the original contract price, premiums must be adjusted accordingly. If the original figure is higher than the final price, the surety must refund part of the original premium; if the original figure is smaller than the final price, the contractor must pay an additional premium.

Another time that contractors run into difficulty is when they fail to obtain definite rate quotations from the surety before submitting a bid. Experience has taught the sureties that some types of construction are more quickly and more easily performed than other types. Some of the factors that make this possible are the use of standardized materials and equipment, off-site fabrication of construction components, and other practices that reduce the over-all risk of construction. Reduced rates apply to such work.

Types of work that take these lesser rates include airport runway and highway paving, hydraulic dredging, some bridge construction, and a lot of subcontractor work. The thing to remember, however, is that when a project includes paving, but also includes other work that may take the higher premium rate, *all* of the work takes the higher premium schedules; when a contract covers work that includes two different rate classifications, the higher rate applies.

Many contractors and subcontractors who furnish surety bonds, as well as many owners who require them, are inclined to consider bond premiums as a net expense. The fact is that bonds usually produce direct benefits to both the giver and the receiver.

Bonds Lower Costs

As an example, consider the prime contractor who furnishes a labor and materials payment bond in addition to the usual performance bond. Ordinarily, the subcontractors and materials and equipment suppliers must liquefy their accounts receivable to obtain capital to perform the jobs assigned them by the prime contractor. To do this, the subs and suppliers gen-

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erally secure bank loans. Depending upon the bank's judgment of the risks involved, these loans carry varying rates of interest.

Because the risk to the bank is lessened, the interest rate is lower, and the sub or supplier does not have to pass on excessive interest costs in his price to the contractor. Equally important is the fact that because the contractor is bonded the sub and supplier is relieved of the need of including in their prices any direct provision for credit risks. The result is a clear reduction in the prime contractor's over-all costs.

Contractors have found another "hidden" advantage in bonds. They have discovered that sponsoring authorities are giving their business to contractors who are able to secure good bonds. For this reason, an increasing number of contractors are furnishing bonds voluntarily to owners. They do this to induce architects and engineers to consider the advantages of employing them over less reliable competitors who cannot readily furnish such bonds. Under such conditions a bond must be considered a business asset to the contractor.

Sureties Sometimes Help

The bonded contractor enjoys still another, little known advantage. Surety company claim files record may instances of honest and capable contractors whose ability to proceed with a job was affected by legal difficulties or other encumbrances not directly connected with the bonded construction. These difficulties often threaten to freeze the working capital the contractor desperately needs to complete his contract successfully.

In some cases, provided the contractor has proved himself reliable in earlier associations with the surety, he has received immeasurable assistance. This help sometimes takes the form of bonds furnished by the surety to discharge liens that have been tying up the contractor's capital. In other cases, direct cash advances are made by the surety to the contractor so that he can liquefy his frozen assets and proceed with his job.

Such contributions by the sureties are rarely publicized for obvious reasons, and the situation is often resolved without the owner or the contractor's creditors knowing that the contractor has been in difficulty.

BONDS FOR THE CONTRACTOR

THE FOLLOWING are the types of bonds most frequently furnished or accepted by contractors:

BID OR PROPOSAL BONDS — These guarantee that, if a contract is awarded, the contractor will execute the contract forms and furnish the required payment and performance bonds in such form as the owner may approve. The amount of such a bid bond is generally 10% of the bid price. This is meant to cover the difference between the first two competent bids. Bid bonds provide the contractor with a working advantage because — unlike deposits—they do not tie up his working capital and he does not pay interest for bid checks secured from banks. The contractor pays a $5.00 service charge yearly, which covers the cost of all his bid bonds. Surety profit comes from issuing payment and performance bonds for the job.

PERFORMANCE BONDS—These guarantee performance of a contract and provide indemnity in case of default. A performance bond bond guarantees that the contractor will perform his obligations—providing the owner performs his. The surety is liable only for the contractor's obligations.

Because experience shows that some types of work are less hazardous than others, sureties set varying rates of premiums and qualification standards for three classes of work. Remember that if a contract covers two or more work classifications, the premium rates for the highest classification apply to all the work.

PAYMENT BONDS—These guarantee payment for labor and materials used or supplied in the performance of construction contracts. When required by federal or state legislation, the extent of coverage provided by these bonds depends on statutory requirements. Depending upon applicable statutes or on the provisions of the bond, they may cover the contractor's payroll and his obligations to subcontractors and materials suppliers under direct subcontracts with the principal; or such bonds may protect direct creditors not only of the principal but also creditors who deal with the subcontractors or materialmen of the principal. In the case of bonds required under the federal Miller Act, they may cover labor, subcontractors or materialmen, no matter how far removed from the general contractor, who perform any of the work or who furnish any material or equipment for use on the project.

It is of the utmost importance that general contractors know the extent of their liability to trade creditors so that they can establish proper accounting and payment procedures for each project.

MAINTENANCE BONDS—These guarantee that the contractor will maintain work free from defects in materials and workmanship for a given period of time. This bond differs from an efficiency guarantee, which involves responsibility for design. Responsibility for design is an obligation of the owner, and the contractor should not accept liability for it.

When a performance bond is given, the surety will bond the first 12 months of the maintenance guarantee against defective workmanship and materials without additional premium charge, whether maintenance is covered in the performance bond or is separately bonded. Maintenance guarantees usually run for one year after completion and acceptance of the entire contract.

BONDS TO DISCHARGE LIENS OR CLAIMS—Subcontractors, laborers, and materialmen who have not been paid for work performed may file mechanics liens against owners of private property and the premises on which the work was done, or against money earned and payable to the general contractor of public work. Claimants seeking damages for personal injuries or property damage may similarly file claims against property or funds.

Such liens and claims are filed against the owner, but the owner will invariably suspend his payments to the contractor until litigation determines the extent of the liability of all parties involved. This can tie up capital that the contractor needs to complete his project.

Mechanics liens can be discharged by filing a surety bond in an amount fixed by an order of the court. In the case of claims for injuries or property damage, the owner usually fixes the penalty of the bond. While the bond is in a form that apparently obligates the

continued on page 142

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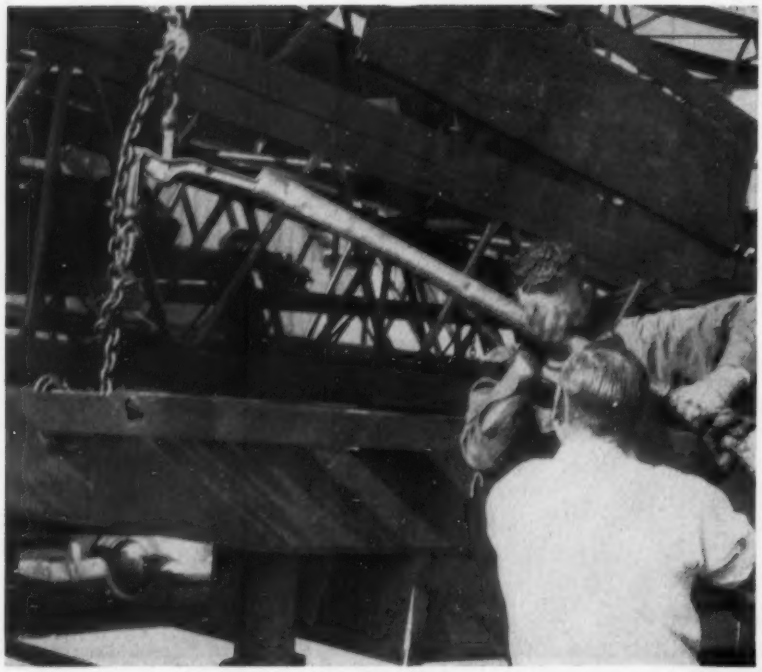

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SURETY BONDS . . .

continued from page 139

contractor and the surety to pay the liability ultimately imposed upon the contractor, the fact is that the bond actually releases the cash withheld by the owner. Because the surety theoretically becomes liable for the released funds, the bond is actually a pure financial guarantee, and for this reason it is underwritten conservatively.

If the surety is already liable for payment of the contractor's bills under a payment bond, the surety does not actually increase its liability by issuing bonds against liens. But if no payment bond is in force, the surety's liability is increased and new collateral or security is necessary. The premiums for bonds discharging mechanics liens, since they are basically financial guarantees, are high and they are charged annually until the courts decide the issue.

INDEMNITY AGAINST LIENS — Bonds described above are to discharge liens *after* they are filed; in some cases bonds are required to protect against the filing of mechanics liens *before* any such liens or claims are filed. Such bonds provide indemnity against the impairment of title or other damage to the beneficiary named in the bond.

JUDICIAL BONDS— Contractors are often required to institute legal proceedings for various purposes, and in such cases they are required to furnish judicial or court bonds. This is especially true in "foreign" jurisdictions, such as in states other than the contractor's home state. Such bonds may be required to provide security for court costs, to pay judgments, to obtain injunctions, etc. Bonds given on behalf of defendants, rather than plaintiffs, are difficult to obtain, and they are expensive.

MISCELLANEOUS INDEMNITY BONDS —Like financial guarantees, indemnity bonds are flexible and can cover any number of situations. Since they are often required against *potential* rather than present liability, underwriting requirements are less strict than for financial guarantees.

Some of the more common forms of indemnity bonds required of contractors include: bonds given to railroads to cover "hold harmless" clauses protecting them against disruption of traffic; bonds to owners against injury to persons or

She's learning how...

with Le Roi's new shock-absorbing rock drill

Dog-gone if Le Roi didn't go and do it! They finally invented a rock drill that takes the tooth-rattling kick out — but keeps the rock-hammering bite in! Why, even a girl can handle it! A special torsion rubber cushion in the handle stops 55% of the worker punishment without sacrificing an ounce of impact at the bit. That means less fatigue—greater comfort—higher man/day production.

Interested? Well, head for your Le Roi distributor . . . he's got the new Model H10, H111, and H12 sinkers in stock . . . he'll demonstrate. Or write Le Roi Div., Westinghouse Air Brake Co., Milwaukee 1, Wis. P.S. The girl's name is June, 5'4", 110 lbs., 36-22-36.

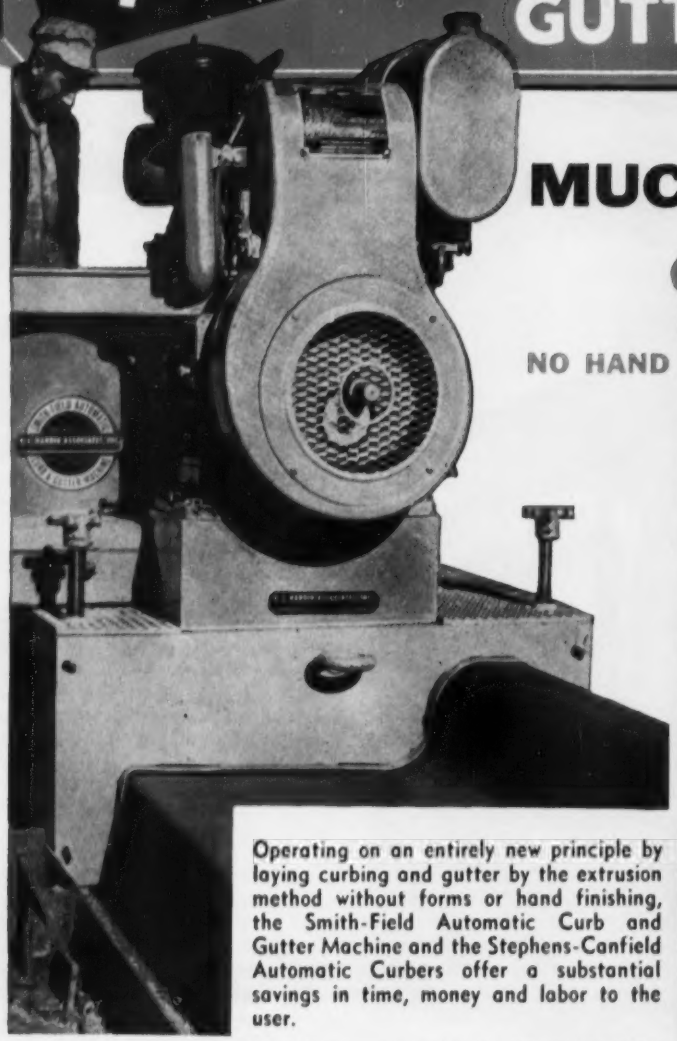
LE ROI NEWMATIC AIR TOOLS

PORTABLE AND TRACTAIR® AIR COMPRESSORS • STATIONARY AIR COMPRESSORS • AIR TOOLS

Faster BETTER CURB AND GUTTER LAYING at MUCH LESS COST

Save TIME, MONEY AND LABOR WITH THIS NEW METHOD

NO HAND FINISHING —— NO FORMS



SMITH-FIELD AUTOMATIC CURB AND GUTTER MACHINE MODEL MARK 3

Operating on an entirely new principle by laying curbing and gutter by the extrusion method without forms or hand finishing, the Smith-Field Automatic Curb and Gutter Machine and the Stephens-Canfield Automatic Curbers offer a substantial savings in time, money and labor to the user.

Working equally well with either Asphaltic or Portland Cement concrete, the Smith-Field Automatic Curb and Gutter machine will lay up to 1,000 ft. of integral curb and gutter per day, under efficient methods and the Stephens-Canfield Automatic Curbers, up to 2,500 ft. per day.

Write for full details and prices

STEPHENS-CANFIELD AUTOMATIC OFFSET CURBER MODEL 56-W

STEPHENS-CANFIELD AUTOMATIC CURBER MODEL 55A

E. L. HARDIN ASSOCIATES, INC.

SALISBURY, NORTH CAROLINA U. S. A.

SOLE MANUFACTURERS AND DISTRIBUTORS—U.S.A. AND FOREIGN
PATENT NO. 2,707,422—AND OTHER PATENTS PENDING

TYPES OF BONDS . . .
continued

property; and bonds to indemnify owners who allow the withdrawal of retained percentages.

PAUPERS' BONDS — Local governments sometimes require contractors to furnish paupers' bonds, which guarantee that indigent workmen imported from other areas will not become public charges. Contractors should arrange for the formal cancellation of such bonds as soon as the contract is completed, or when the need for imported labor ends. Otherwise, contractors may find the local authorities asserting claims indefinitely for any stranger in the area.

RENTED EQUIPMENT AND LEASED PROPERTY BONDS — In addition to the routine rental of ordinary construction equipment, the contractor often has occasion to rent costly special equipment or to lease public lands, rights of way, railroad spurs, etc. Surety bonds are frequently required to guarantee payment of rent, operating costs, and labor, or to indemnify the owner against loss or excessive wear and tear.

The form of such bonds will vary with the circumstances of the rental, the cost of the rented object, etc. Usually such bonds run for limited periods, but in some cases, such as for rented railroad spurs, the bonds may remain in force for years.

WORKMEN'S COMPENSATION AND DISABILITY BONDS — In lieu of the usual Workmen's Compensation Insurance, or as an addition to this insurance, contractors are sometimes required to furnish bonds in order to qualify as self insurers with state officials or to indemnify owners against statutory liability resulting from the contractor's operations. The amount of such bonds is fixed by law or by the determination of the owner.

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Construction Methods and Equipment's special issue devoted to Construction Equipment Maintenance.

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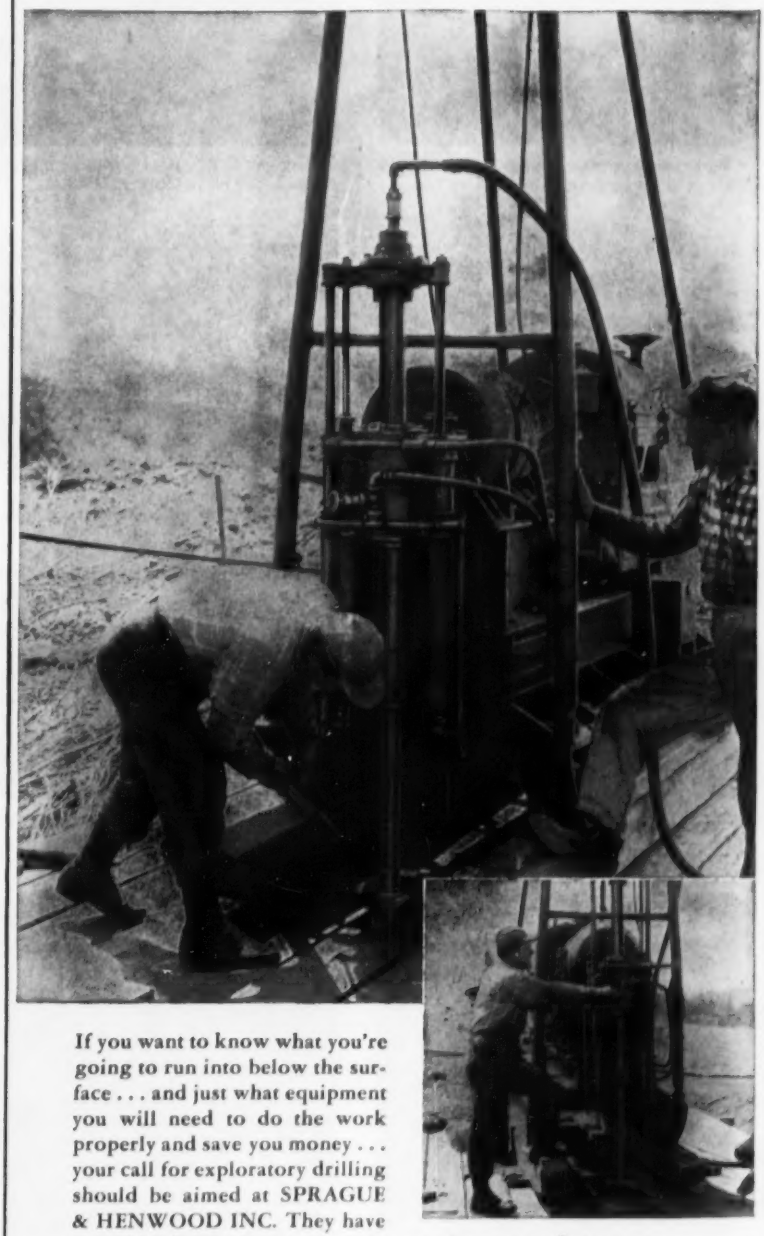
YOU'LL KNOW WHAT'S THERE ...BEFORE YOU KNOW IT...



If you want to know what you're going to run into below the surface . . . and just what equipment you will need to do the work properly and save you money . . . your call for exploratory drilling should be aimed at SPRAGUE & HENWOOD INC. They have a wealth of experience and modern equipment ready to serve you. Well-trained personnel, adequate supervision and the latest in machinery, all tend to assure you the results you are looking for.

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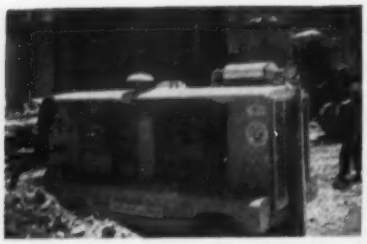


Murchison Skyscraper, Denver—Pile driver is air-powered from this G-D Rotary 600.

Lucin Cutoff—G-D Rotary 600 supplies air for dumping fill in Great Salt Lake.

New York State Barge Canal—G-D Rotary 600 portable supplies air for pile driver.

El Paso Gas Pipeline Project—G-D "Quadril" and rotaries for trenching through rock.

Calumet-Sag Channel—G-D rotary compressor furnished air for tractor-mounted drill.

St. Lawrence Seaway—Line drilling with G-D wagon drills and Rotary 600 portable.

Connecticut Turnpike—G-D "Air Trac" self-propelled, crawler-mounted drilling units.

Dalles Dam — G-D "Air Trac" drills maneuver readily over rough terrain.

Snowy Mountains Hydroelectric "Air Trac" joins other G-D equipment in Australia.

Pelton Dam—G-D S55 sinker drills blast holes for cutting keyway in solid rock.

Chiese Hydroelectric Project—In Italy, G-D "Air Trac" tackles dense Alpine granite.

Chicago Filtration Plant—G-D rotary compressor sinks shaft to water tunnel level.

THERE'S A GARDNER-DENVER DISTRIBUTOR IN YOUR AREA / **SEE HIM FOR DETAILS**

Noxon Rapids Hydroelectric Project—G-D "Air Trac" drills work 'round the clock.

Beauharnois Canal and Lock—G-D "Air Trac"® drills on St. Lawrence Seaway.

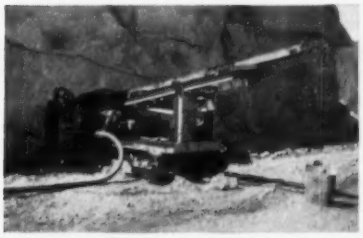
Massachusetts Turnpike—G-D "Air Trac" positioned for drilling angle holes.

On job after job . . . great contractors choose Gardner-Denver equipment

Montgomery Dam—Self-propelled G-D "Air Trac" drills work hillside cut.

Wishon Dam—G-D rotaries power "Air Trac" and heavy-duty G-D 5½" drill.

Pennsylvania Turnpike Extension—G-D "Air Trac," wagon drill, Rotary 600 on rock cut.



San Francisco Freeway—G-D 5½" DH143 drill helps move a million yards of rock.

Contractor's Hill—G-D tractor-mounted booms and drills on Panama Canal job.

Swift Creek Tunnel—G-D drifters and hydraulic booms on truck-mounted jumbo.

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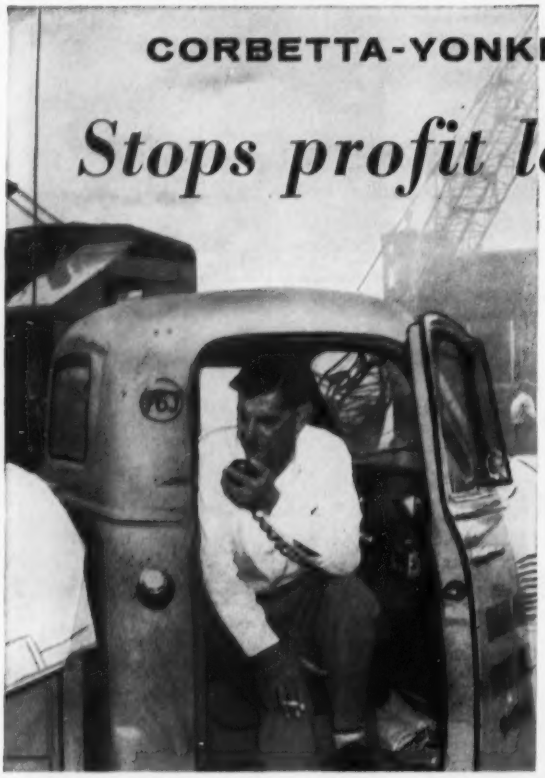
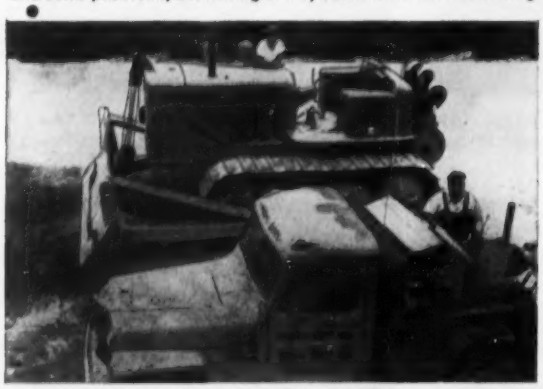
CORBETTA-YONKERS JOINT VENTURE

Stops profit leaks with radio



A Superintendent Should be Everywhere to answer questions and solve problems, but having 2-way radio is the next best thing.



It Costs Money to have a Bulldozer Idle! These mechanics arrived minutes after the breakdown because they were called by radio.

When you've bid on and received the contract for a construction project, every dollar you save goes towards *profits*. That's why the joint venture of Corbetta Construction Co., New York City, and the Yonkers Contracting Co., Yonkers, N.Y., on a three-mile stretch of the New York Thruway, depends so much on its Motorola 2-way radio system.

With about 450 men on the job, using approximately 250 pieces of major equipment to build 8 bridges and miles of retaining walls, as well as the main highway, there are many opportunities to save money with radio.

For example: when a truck, dozer, loader, drag line or shovel breaks down, every minute of delay in getting a crew to fix it costs money for machine and operator, and delays the project. But, with Motorola 2-way radio, it takes only *seconds* for a superintendent to contact a mechanic and have help on the way.

160 Calls per Day reports the base station dispatcher.

Or, if lack of a compressor is holding up an important job, it takes just a few minutes to contact everyone using compressors and find out who can spare one. There may be a question about the location of a utility line. Are the utilities superintendent's drawings up to date? There's no danger of a major mistake when he can pick up his microphone and call field headquarters for the answer.

Planning the next day's work is fast and easy. Just hold a conference over the Motorola radio and save hours of expensive supervisory time. Or when you are pouring concrete. Where is it needed? How much more is wanted? No difficulty getting the answers via radio . . . one man can take care of it.

Just a few of the ways in which Corbetta Yonkers cuts costs, increases profits with Motorola 2-way radio. Learn how you, too, can increase profits on your next job. Write, phone or wire: Motorola Communications & Electronics, Inc., Construction Department.

MOTOROLA

2-WAY RADIO

MOTOROLA COMMUNICATIONS & ELECTRONICS, INC.
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Motorola consistently supplies more mobile and portable radio than all others combined.
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The only COMPLETE radio communications service—specialized engineering...product...customer service...parts...installation...maintenance...finance...lease.
"The best costs you less—specify Motorola."

Euclid Scrapers and Crawlers are your best investment

Overhung engine type Scrapers of 7, 12, 18 yds. struck capacity

Powered by engines of 143, 218 and 300 h.p., these scrapers have heaped capacities of 9, 16 and 25 yds. Advanced design of Euclid's hydraulic lever action, low bowl and 4 section cutting blade provides fast, easy loading. The 18 yd. model has Torqmatic Drive . . . all have NoSpin differential and Euclid planetary drive axle . . . unequalled accessibility of the power train and major components.

TC-12 Twin-Power Crawler

A completely new concept in tractor design and performance, this Euclid Crawler has two 218 h.p. engines for a total of 436 h.p. There is a separate Torqmatic Drive for each track. Top speed is 8 m.p.h. —change from one speed range to another or to one of the three reverse speeds is made under full power. Planetary drives can be serviced without removing track, frame or drive sprocket. Operating weight, bare, is 62,500 lbs.

Four-wheel Tractor Scrapers

These 12, 18 and 24 yd. scrapers have maximum stability for rough roads and high speed hauls. At 3:1 slope heaped capacities are 14, 20 and 27 yds. A 200 or 218 h.p. engine with 5-speed transmission powers the 12 yd. scraper . . . drive tires are 21.00 x 25 with 24.00 x 25 optional. The 18 yd. scraper has 300 h.p. with 3-speed Torqmatic Drive . . . standard tires are 24.00 x 25 with 29.5 x 25 optional . . . a 17 yd. bottom-dump is interchangeable with the scraper. The 24 yd. scraper has a 300 or 335 h.p. engine with 4-speed Torqmatic Drive and 27.00 x 33 tires . . . 33.5 x 33 drive tires are optional equipment.

Twin-Power "Euc" Scrapers

These scrapers have capacities, struck, of 18 and 24 yds. — heaped at 3:1 slope, 21 and 27 yds. Both models are powered by two engines, each with Torqmatic Drive, and have 27.00 x 33 tires with 33.5 x 33 optional. The Model TS-18 has a total of 436 h.p. Tractor of the Model TS-24 has a 300 h.p. engine—scraper wheels are driven by a 218 h.p. engine—a total of 518 h.p. "Twins" outperform other scrapers by a wide margin—they self-load and work under conditions that stop other scrapers.

Your Euclid Dealer will be glad to provide information on the complete line of "Euc" Rear-Dumps, Bottom-Dumps, Scrapers, and Crawler Tractors

EUCLID DIVISION, GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

MIXER TRUCK chutes stiff concrete mix for roof panels directly into steel forms. Specifications allow a tolerance of ¼ in. in overall dimensions of panels, and engineers test every 250th panel for deflection. Contractor casts 60 panels at a time.

Precasting Factory Turns Out

CASTING BEDS operate on production line schedules at McClellan Air Force Base where contractors are turning out 9,200 thin shell roof panels and 800 roof beams for a pair of huge warehouses.

The two warehouses will enclose 35 acres of land and provide 1,500,000 sq ft of storage space for the Sacramento Air Materiel Area. They are identical single-story structures—separated only by a railroad spur—except that one is 400 x 1,800 ft and the other is 400 x 2,000 ft.

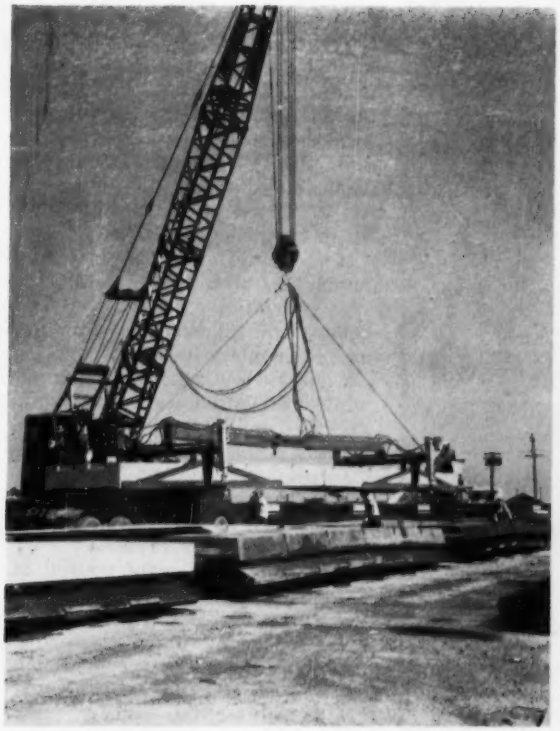
TWO BIG WAREHOUSES, separated only by a railroad spur, sprawl over 35 acres. Construction began in July, 1955, and is scheduled for completion in January, 1958.

Four Sacramento, Calif., contractors — the Heller, Campbell, Erickson, and Lawrence construction companies — are building the warehouses as a joint venture. Estimated cost of the project is $7.3 million.

The panels are cast 60 at a time in a yard near the site. So far, the contractors have produced more than 6,500 of the panels and installed most of these. Each of the panels is 33 ft 4 in. long and 5 ft wide. Depth at the rib is 12 in.; at the center, only 1¼ in.

The panels are cast in steel forms. Concrete mix is portland cement and a high grade of expanded shale aggregate. When the mix is in the form, workmen pass a Free-Piston air vibrator across the top of the stiff, lightweight concrete. The vibrator serves primarily as a screed; it vibrates only the top of the mix.

After 48 hr in the forms, the panels are stripped, sprayed with a light Hunt's Process membranous curing compound, and stacked to cure for 60 days.



CRANE lifts panel from forms after 48 hr. Outriggers on lifting bracket are jacks that break the panel free from the steel forms.

LIFTING BRACKET with a jack as an outrigger at either end is operated hydraulically from controls in the cab of the crane.

10,000 Beams, Roof Panels

Stripping the panels might have been a problem except for a special lifting device operated from the cab of the crane. Although the steel forms are coated with a mineral oil bond-breaking agent before concrete is poured, still the force required to break the panels free of the forms sometimes is greater than the safe lifting capacity of the crane. So the contractors mounted a pair of hydraulic jacks as outriggers on the lifting bracket. The jacks react against the ground to break the panel free, then the crane takes over.

A Ross straddle carrier, modified by placing the pickup points ahead and behind the wheels instead of at the middle of the carrier, transports the panels. The carrier can handle three panels at a time.

For the roof beams, the contractors designed and built nine sets of special metal forms with sides that drop down to permit lifting the roof beams out. The beams are stripped after 18 hr.

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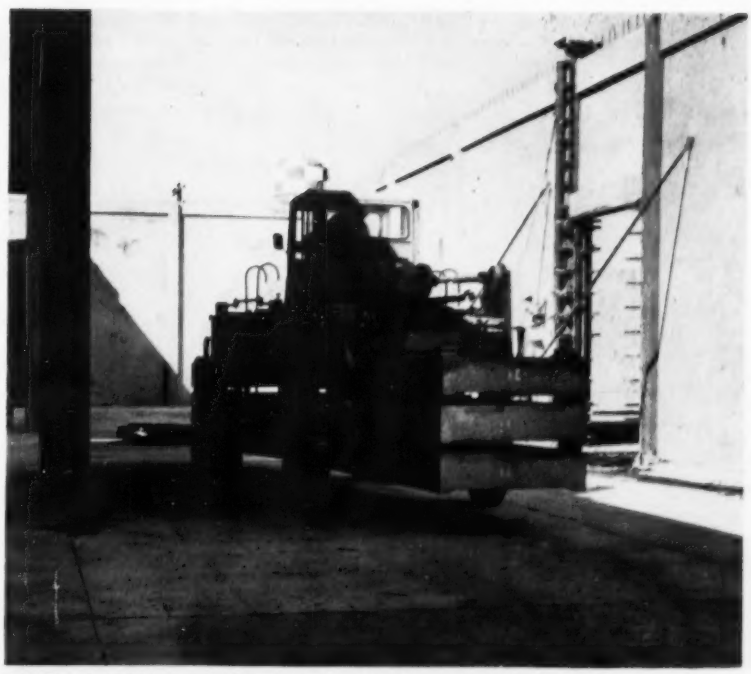
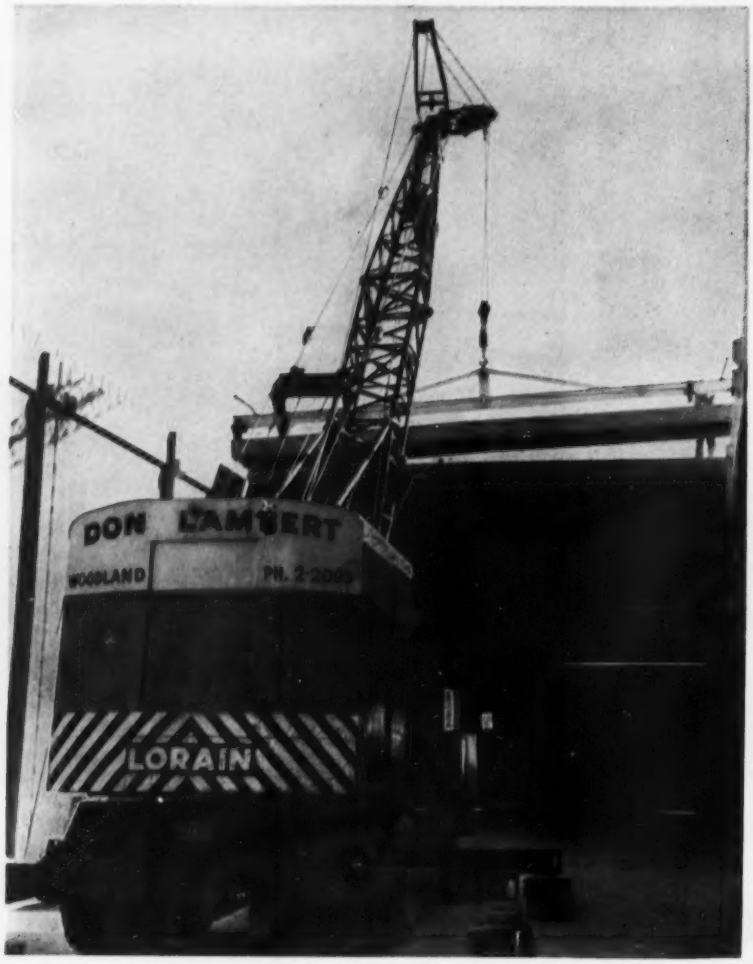


STRADDLE CARRIER, modified by placing the pickup points at the ends instead of in the middle, hauls a stack of three panels from the casting yard to the site for erection.



PANELS are placed by crane with the help of a lifting bracket that has a pin-positioned clip at each end. When the panels are in place (below), they are covered with a 2-in. leveling course of Perlite concrete. Roofing felt and asphalt form built-up roof.

PRECASTING FACTORY...
continued

Preparing the Site

The floor slabs of the buildings are elevated about 5 ft above ground level. H. Earl Parker Co. of Marysville, Calif., the subcontractor for excavation, grading, and filling, removed a total of 38,500 cu yd of top soil and placed 81,000 cu yd of select aggregate fill to form this elevation.

To contain the fill material, foundation wall panels were cast on smoothed ground, placed against the fill, and tied into the poured-in-place pedestals.

Column footings were poured while excavation was under way. For the smaller column, footings are 4x4 ft; for the largest columns, they are 12½x12½ ft. All are reinforced concrete spread footings except those at the firewalls which are drilled belled caissons.

The floor slabs were poured in 25-ft lanes on top of the earth retained by the foundation walls. Because of the unusually heavy loads per sq ft that the floor will have to sustain, this earth fill was compacted to 98% density by a wobble-wheel compactor and a three-wheeled roller.

Floor slabs are mostly unreinforced concrete 8 in. thick. A Noble batch plant at the site fed dry concrete in 5-yd batches to transit mix trucks that placed more than 40,000 cu yd of concrete for the two slabs. A Clary roller screed, powered by a Briggs & Stratton gasoline engine, screeded the concrete to grade. Hand floats finished the slabs.

Contractors found that only one pass by the roller screed was required. This machine has two large rollers that rod off the freshly poured concrete and a smaller roller mounted slightly off-center between the larger pair. The center roller rotates at a fast rate of speed, and the resulting whip action knocks down the rocks and brings up the fines.

To prevent surface checking and cracking, the slabs are fog sprayed immediately after troweling. The fog spray is simply a 1½-in. dia pipe about 25 ft long with fog nozzles at 5 to 6 ft centers. It produces a fine spray that prevents surface cracking.

In hot weather the precast roof panels and the roof beams also are sprayed. And the metal forms used to cast the beams are covered with wet burlap to keep them cool.

continued on page 157

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Tousey **DURACOTE** or
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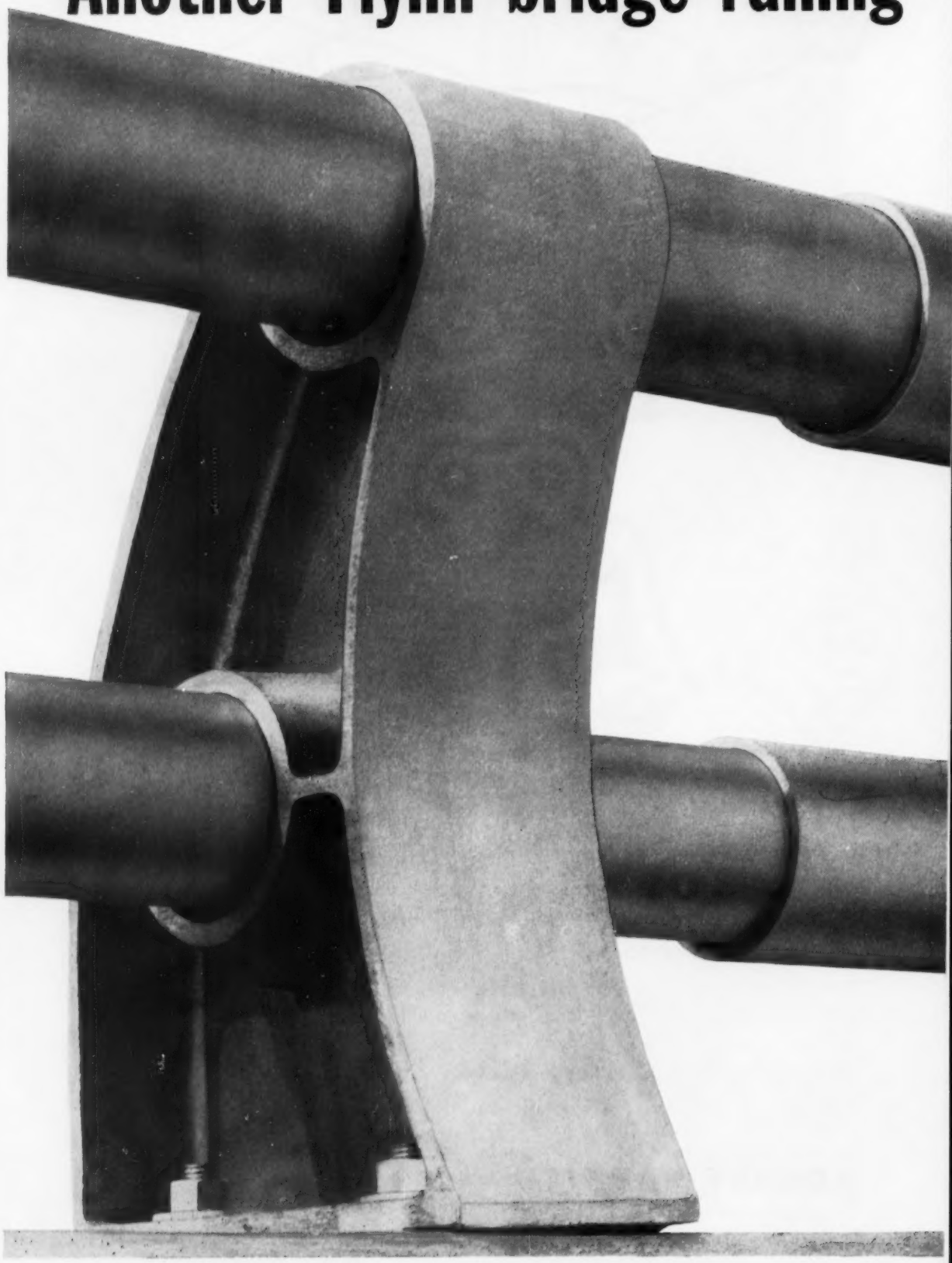
Another Flynn bridge railing



installed to be forgotten

Lightweight aluminum, it will never rust, never need paint. On the new Hampton Roads (Norfolk, Va.) Bridge, this lightweight Flynn railing has been installed for good—in fact, to be forgotten. Maintenance crews can forget about painting and repairing it, because Flynn railing, rail seats, end posts, balusters, anchor bolts, and accessories are made of non-rusting, durable aluminum.

And Flynn extrusions are engineered for maximum strength with minimum weight; nothing short of an accident will make replacement necessary.

In the wide range of Flynn highway- and bridge-railing styles, there should be many that will meet *your* immediate needs. Flynn can also produce custom designs to your specifications . . . in any quantity, large or small. On either stock or custom orders, Flynn delivery is fast and reliable.

Before you bid on your next job involving highway or bridge railing, investigate the many economies of dealing with Michael Flynn.

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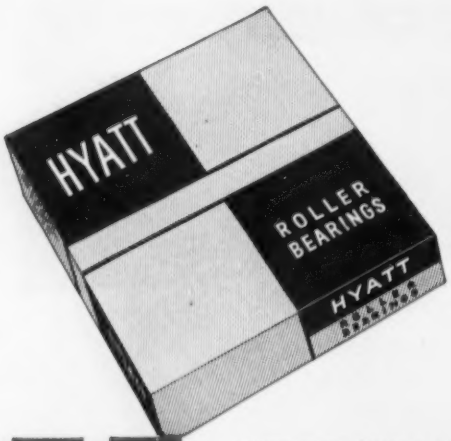
EXTRUSIONS

WHAT'S SPECIFIED?

THAT'S YOUR SAFEST GUIDE . . .

Always replace a HYATT with a HYATT!



The best possible performance . . . that's what the manufacturer called for when he specified HYATTS. That's what you assure when you replace a HYATT with a HYATT—the same troublefree performance originally built into the equipment!

Better still, HYATT Hy-Roll Bearings mean *savings* for you, too—savings in time and trouble! With HYATTS you have no fitting adjustments to make—they're completely interchangeable! So be sure you get HYATT Hy-Roll Bearings —then you're sure of the lowest bearing cost per hour of service. Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

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GM PARTS SALES

Always look for the familiar blue and yellow box —when it comes to quality, there's no substitute for

HYATT HY-ROLL BEARINGS FOR REPLACEMENT

ROLLER SCREED rods off the freshly poured concrete for the floor slabs in only one pass. Slabs then are hand-troweled to produce a smooth, impervious surface. Floor slabs were poured in 25-ft lanes with inserts left in the slabs for temporary wall braces.

Framing and Wall Panels

Erection of poured-in-place, continuous reinforced concrete framing and casting of wall panels began as soon as the first floor slabs had cured. Exterior wall columns are 24x20 in. at the bottom, increasing to 42x20 in. at the top. Reinforced concrete girders are continuous across the 400-ft width of the buildings except for expansion joints near the middle. They span 67 ft on 33½-ft centers.

Framing is poured from 1-yd buckets with concrete supplied by mixer trucks. Side forms for the girders are ¾-in. plastic-coated plywood that can be reused as many as 30 times. The bottom forms are sheeted with metal to prevent damage when reinforcing steel is dragged over them.

The wall panels are cast on the floor slab and tilted into place by 30-ton Lorain cranes. Exterior and shear wall panels are 6 in. thick; firewalls are 8 in. thick.

Throughout the building, firewalls abut the shear walls at the end of each 200 ft bay. They are the heaviest of the wall panels. The largest of the firewall panels measure 27 ft long, 24 ft high, and weigh 27 tons. Wherever there is a fire wall, both the shear walls and the firewall are erected before the columns are poured.

continued on page 162

CRANE walks heavy wall panel into position by backing into it and skidding it along the floor. Initial lifting took crane's front wheels off floor despite counterweight.

High altitudes, narrow benches severely test this Michigan, yet every day it loads

400 tons of rock weighing 5,400 lbs per cubic yard

Up in the scenic Sapphire Mountains of southwestern Montana, Cummings-Roberts Company has one of the toughest rock-loading jobs you could find anywhere.

Part of the time, they blast and load coarse mountain-top granite . . . summer and early fall, they load fluorspar. No one needs to detail what a severe test the heavy, rough granite overburden gives to *any* loader. Fluorspar, however, is even worse. A heavy rock mineral, it weighs 5,400 pounds per cubic yard—over 850 lbs more per yard than in-bank granite (and 2,200 lbs more than pit-run gravel).

Proved by demonstration

Over the years, Cummings-Roberts has tried just about every kind of loader made. Last year to increase efficiency, their Michigan distributor, Miller Machinery Co., Missoula, suggested a Model 175A Michigan Tractor Shovel. "Frankly," Cummings-Roberts officials told them, "we don't believe *any* rubber-tire unit can load the stuff, much less do the work day in and day out. But we'll give it a try."

Result? John Taber, General Superintendent, wouldn't let them take the Michigan off the job.

Heaped loading assures proper blending

Today, the 133 hp 2¾ yard Michigan handles *all* loading of the super-heavy fluorspar. Production, with trucks on 600 ft one-way hauls to crushing mill, averages 400 tons per 7-hour day. The fluorspar, incidentally, varies considerably in grade from place to place through-

out the mine. It must be blended to give the grade desired for shipment . . . and this assignment goes to the Michigan, too. Its 27 mph mobility is a vital asset on this scattered loading; trucks never wait more than a few minutes for loading service.

Strips granite overburden — 500 tons per day!

In late autumn and sometimes in spring, the Michigan strips the granite overburden. Output averages *500 tons* per 7-hour day.

Downtime negligible

With all this rugged loading of super-heavy material, plus repeated back-and-forth maneuvering on narrow benches, plus continuous work at high 6,800 to 7,000 ft altitudes, the torque converter equipped Michigan has posted an excellent mechanical record. *To date, it has had only one minor breakdown!*

Also tows compressors, speeds other odd jobs

Operator Don Lindblom likes Michigan's powershift transmission, says its bucket action is the best he's ever worked with. "You can tip it back and fill it easily," he says. "I like the fact also that it takes only half-an-hour per day to refuel and lubricate." Foreman Waino Lindblom adds, "The Michigan has done a nice job for us! We particularly like its truck-like speed in moving from bench to bench." This mobility gives the Michigan some "spare time" to handle maintenance jobs scattered along 15 mi of mountain roads—cleaning rock rubble off benches so trucks and wagon drills can get through . . . hauling air compressors . . . digging culverts . . . even plowing snow.

Got a tougher job than this?

There *may* be a tougher materials-handling job than loading granite and fluorspar . . . but we're willing to bet a Michigan Tractor Shovel can do it faster, better, at lower cost than any other machine. To prove it, your Michigan Distributor will be glad to arrange a demonstration at *your* convenience. *You pick the jobs.*

CLARK EQUIPMENT

Michigan is a registered trade-mark of
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Construction Machinery Division
2403 Pipestone Road
Benton Harbor 33, Michigan
In Canada: Canadian Clark, Ltd.
St. Thomas, Ontario

11,000-car parking area is paved with Asphalt

ROOSEVELT FIELD SHOPPING CENTER

Garden City, L.I., N.Y.

Largest shopping center in U. S.

a
WEBB & KNAPP
project

Emulsified Texaco Asphalt and gravel are mixed by single-pass stabilizer.

Asphalt-coated gravel is spread to desired depth and compacted.

Applying seal coat of Texaco Rapid-curing Cutback Asphalt.

Roller imbeds stone chips in Cutback Asphalt seal coat.

ASPHALT CONTRACTORS
Frank Marmorale
The Lansdell Company
Standard Bitulithic Co.

CONSULTING ENGINEERS
(Paving)
Moran, Proctor,
Muesser & Rutledge

ENGINEERING • RESEARCH • EDUCATION
THE ASPHALT INSTITUTE

MEMBER

Roosevelt Field Shopping Center, with its million square feet of retail space, is the nation's largest development of its kind. An essential feature of such a center, if it is to attract and bring customers back in sufficient volume, is an adequate parking area.

Roosevelt Field has parking facilities for 11,000 automobiles. Texaco Asphalt products were used not only to construct a durable pavement at moderate cost on this area, but also in the asphalt curb, which subdivides the parking space.

Emulsified Texaco Asphalt, with gravel available on the site, were mixed thoroughly by a single-pass stabilizer, spread over the parking area by power grader, then rolled to a compacted thickness of two inches. This was followed by a seal coat of Texaco Rapid-curing Cutback Asphalt, covered with stone chips.

The 36,000 linear feet of Texaco Asphalt curb was laid on the asphalt pavement by a special machine, then painted white for greater visibility.

There is a type of Texaco Asphalt construction for every paving need, whether the project is the country's largest shopping center, an expressway by-passing a large city, or a farm-to-market road. Helpful information on all of these heavy-duty, intermediate and low-cost types of construction is supplied in two booklets, which can be obtained without obligation by writing our nearest office.

THE TEXAS COMPANY, Asphalt Sales Div., 135 E. 42nd Street, New York City 17

Boston 16 • Chicago 4 • Denver 1 • Houston 1 • Jacksonville 2 • Minneapolis 3 • Philadelphia 2 • Richmond 19

TEXACO

TEXACO ASPHALT

"At least one dozer in five should be on rubber!"

says Villa Contracting Company, Westfield, N. J., owners of this Michigan

When Villa Contracting Company decided to update their rubber-tire dozer fleet recently, their choice was the 165 hp Michigan Tractor Dozer.

"We very much liked Michigan's simple, dependable hydraulic control system," explains Partner George Villa . . . "its trouble-free oil-sealed clutches . . . and the fine service record of our Michigan Tractor *Shovels*. Tests on the job showed us the Michigan *Dozer* would do as much work as *any* rubber-tire dozer . . . and its price was about $6,500 less than other big units. *So we bought it!*"

Saves $150 per move

Michigan is really fast on the job, according to Milford Redman, Villa's General Superintendent. "Spreading fill, for example, it does the job *20% to 50% faster* than big track-type dozers," he says. "Between jobs, the Michigan is a lot faster, too. To move crawlers we have to call for a trailer—and it can take half a day to get one from the shop. We figure *each* move costs up to $150—and on a widening job we might have to move dozers *five times a week*. Our Michigan can travel the couple of miles required in ten minutes *under its own power*. Its cost, including operator's wages: about two bucks."

"A Michigan pays off on every job"—owner

"We feel it pays to have at least one such rubber-tire dozer *on every job*," says George Villa. "My guess is, the average road-building contractor should have one for every four or five crawler-type dozers. Of course, if your work is in sand you can easily use *more* rubber-tire machines —in city or sewer work, a *lot more*."

"Works faster and better"—operator

"I like the way all controls are at my fingertips," reports Operator Al Therrien, veteran of six years on graders, dozers, pans, etc. "Our Model 180 carries the grade easily. The blade floats in neutral position, and it's easy to backblade and clean up as I go along." Traveling between assignments, Al reports he stays right up with traffic. "And the Michigan is under perfect control always," he says. "Power steering and power brakes make driving it a cinch!"

Let their experience be your guide

Villa Contracting Company asked for a demonstration from their local distributor, Equipment Distributors, Inc. They saw what the Michigan Tractor Dozer could do . . . and, they *bought* the obvious savings in time and money. Why don't *you* do the same? Your local Distributor will be glad to arrange a test—*you* pick the job. And ask him about the wide variety of purchase plans available . . . including Clark's no-money-down, pay-as-you-profit lease-purchase plan. With it, you can put one or more Michigans to work without laying out a penny of capital!

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Construction Machinery Division
2403 Pipestone Road,
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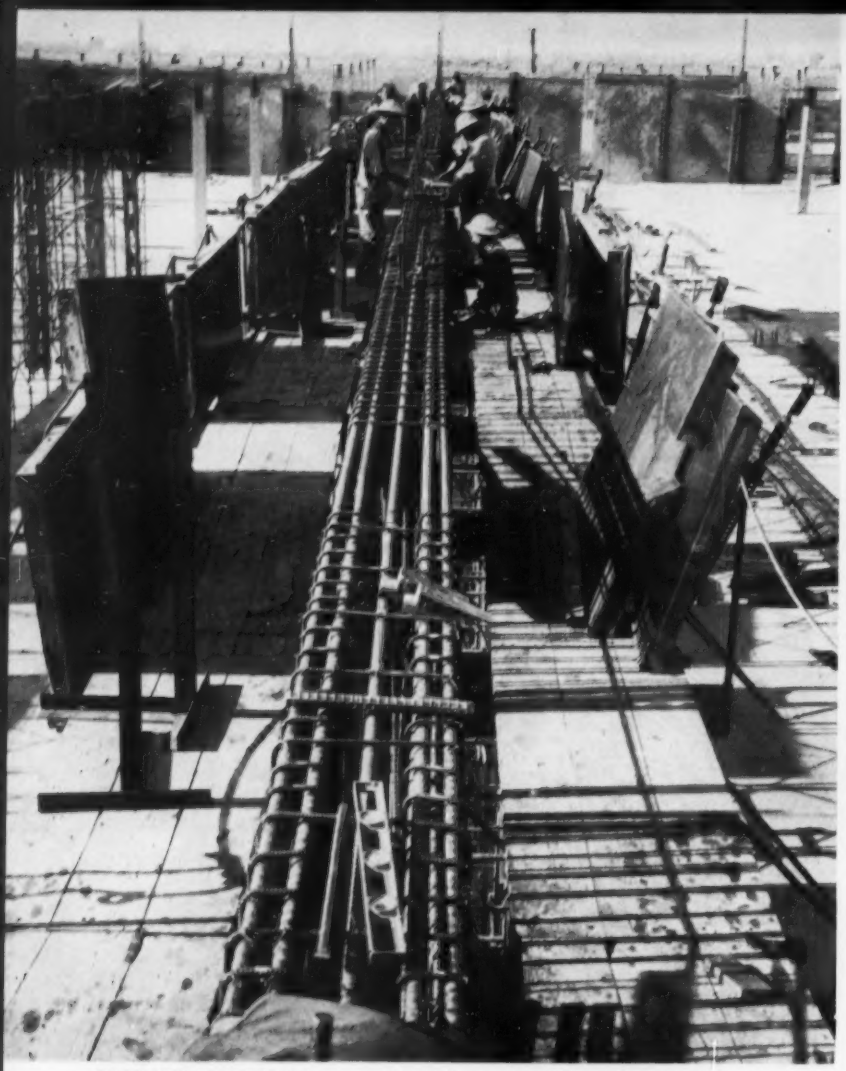
CLARK® EQUIPMENT



CAST-IN-PLACE GIRDERS are heavily reinforced their full lengths. Side forms are plastic-coated plywood; soffit form is metal-clad. Forms are reused as many as 30 times.

PRECASTING FACTORY...
continued

Modifications

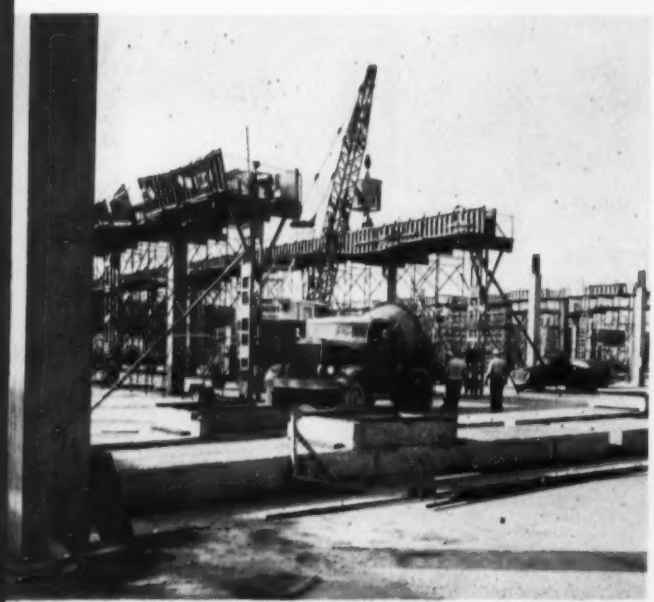
The two warehouses are based on a standard design drawn up by the L. P. Kooken Co. of Baltimore, Md., and adapted to the site by the Tudor Engineering Co. of San Francisco. Warehouses of the same basic design have been completed or are under construction at about 20 Air Force bases.

At some of the first of these structures completed, there were roof failures. So at McClellan Air Force Base both the girders and the columns have been strengthened substantially. Critical areas at the top of the girders have up to six additional #11 steel bars; size of the bars at the bottom of the girders was increased from #9 to #10; columns have four additional bars, and the size of the bars is #11 instead of #10.

Supervision of the work is by the office of the Air Force Installations Representative, South Pacific Region, headed by Col. Edwin M. Eads. Lt. Col. Jack B. Marshall, Installations Engineer at McClellan AFB, is supervisor at the base.

South Pacific Division, Corps of Engineers, headed by Brig. Gen. William F. Cassidy, has design and construction contract responsibility.

The contract for the project was let through the Sacramento District, Corps of Engineers, under Col. A. E. McCollam.



FRAMING of buildings is poured from 1-yd buckets with concrete from transit-mix trucks. Shoring is sectional scaffolding.

COLUMN pour ties together two wall panels. Columns measure 24x20 in. at the bottom, increasing in size to 42x20 in. at the top.

Twenty five ton lifting capacity!
Handles easily . . . fast on the highway . . . and
STRIPS QUICKLY, EASILY TO MEET HIGHWAY WEIGHT LIMITATIONS

"These are the four main reasons we bought our new 25-ton Michigan Truck Crane," says Pete Smith, Secretary of Emmerson Truck & Storage Company, Battle Creek, Michigan . . . "and the four main reasons we like it so much today. Results of the past eight months of work certainly justify our selection!"

Reaches for the sky—or into a building

Photo illustrates one of the "results." Here, with 85 ft boom and 15 ft jib, Emmerson lowered an old 2½-ton (8' high, 3' wide) commercial blower from the roof of Kellogg's Battle Creek plant. Entire assignment took just a few hours, including time for the Michigan Crane to drive 3 miles through town to the world-famous cereal factory *and* time to transport the blower to Kellogg's yard several blocks away. *Cramped quarters,* on the other hand, have proved equally accessible. With a very short boom-end (made in the Emmerson shop) to reduce boom length to 17 ft, the Michigan sets machinery *inside* plant buildings. Negotiating doors as small as 8½ ft wide by 12 ft high, the Michigan drives right in where many 25-ton cranes can't go.

Handles 3-ton horizontal lifts in muck

Another "toughie" the Michigan took in stride was the laying of new 12" gas main under a new river channel. Here, the boom was used *absolutely horizontal*—45 feet out—while the Michigan maneuvered 3-ton pipe sections into place. *Biggest* load lifted to date was a 25-ton press. *Highest* loads have been 5,000 lb buckets of concrete—100 feet up! Some of the *hardest* have been in ankle-deep mud . . . setting huge roof joists, for example. Even at night, with boom flood-lit by portable chassis-mounted generator, Emmerson has set transformers and regulators for Consumers Power & Light Co.

"Performs beyond expectations; not one complaint!"—President

"We're very pleased with our Model T-24 Truck Crane," says Bob Sergeant, President and General Manager of Emmerson. "It's performed beyond our expectations; we haven't one complaint. This Michigan has done everything the manufacturer said it would—*and more!*"

Why don't YOU look into the advantages of a Michigan Truck Crane? Write for new illustrated booklet on the Model T-24 25 Ton Truck Crane. Get the facts, today!

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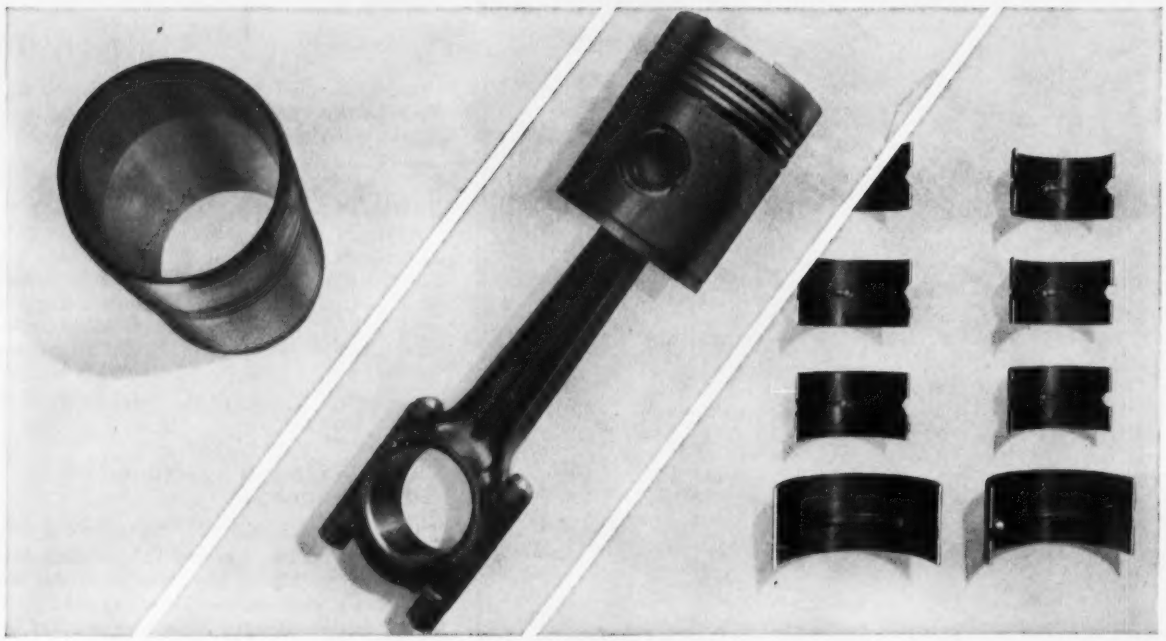
The Engineer's Field Report

CASE HISTORY
RPM Delo Oils
LUBRICANT
Progressive Transportation Co., Compton, California
FIRM

RPM DELO holds piston wear to .001" after 201,253 miles of on-and-off highway hauling



LUBRICATED WITH RPM DELO Oil, these engine parts were pulled from a Cummins HR diesel after 201,253 miles. A portion of this mileage was put on during four months of rugged service spotting loads of heavy pipe in the Arizona desert. When the engine was taken down, after two years of this on- and off-highway hauling, Progressive Transportation Co. found RPM DELO Oil had kept lacquer, gum, sludge, and deposits from forming...rod bearing wear varied between .0005 and .001 inch and pistons showed maximum wear of only .001". No wear at all evident on main bearings. Progressive Transportation uses RPM DELO Oils in all its large fleet of tractors—some of which have traveled well over 200,000 miles without overhaul.

Why RPM DELO Oils prolong engine life

Special compounds stop corrosion

Anti-oxidant resists lacquer formation

Detergent keeps all parts clean

Metal-adhesion qualities keep oil on parts in running or idle engines—inhibitor resists foaming

LUBRICATING OILS RPM DELO

For More Information... about this or other petroleum products of any kind, or the name of your nearest distributor, write or call any of the companies below.

STANDARD OIL COMPANY OF CALIFORNIA, San Francisco 20 • **STANDARD OIL COMPANY OF TEXAS**, El Paso
THE CALIFORNIA OIL COMPANY, Perth Amboy, New Jersey • **THE CALIFORNIA COMPANY**, Denver 1, Colorado

BUYERS GET BARGAINS... Contractors swarm over equipment being offered for sale. Equipment was available for inspection one full week before going on block. Rigs sold for fraction of original cost.

Everybody Wins at Auction

"DREE DREE DREE," said the man in the camel's hair coat into the microphone. "Dreedreedree do I hear faw?"

"Faw!" said a man smoking a cigar.

"We got faw," the man in the camel's hair coat said. "And I'm looking for faw fie. Do I hear faw fie?"

"You got faw fie," shouted a second man in the crowd.

"Five unnert!" said the cigar.

"Now we're moving," said the coat. "Anybody got five fifty. Fie fie fie fie fifty!"

(Long pause)

"I'm not gonna hold this too long," the coat said. "Do I hear five fifty. Come on boys, she's worth more than that as junk. Do I hear five fifty?"

(Long pause)

"Okay," said the coat, clapping his hands together. "I've sold her for one thousand five hunnert dollars! Let's move on to the next machine."

The man in the camel's hair coat picked up a small, portable electric loudspeaker and hopped off the wheel of the big scraper. A murmur rose in the crowd of more than 500 contractors and equipment dealers. Why the commotion? Just the fact that a 12½-yd scraper that had cost about $10,000 new, had been auctioned off for $1,500.

continued on next page

SELLER GETS CASH... In one day equipment dealer sold out his entire yard, collecting $240,000 in cash.

TRUCKER gives buyers estimates on cost of delivering equipment to their yards. Dealer loaded lighter equipment onto trucks free of charge. Heavier rigs were loaded at cost.

Was there something wrong with it? Not a thing except a little wear. Even the tires were in good condition. New, they would sell for about $1,000 each.

The scraper was one of 103 pieces of earthmoving equipment auctioned off in less than four hours in Westbury, N. Y., for a total of $240,000. New, the equipment would have been worth more than $2 million.

H. O. Penn Equipment Co., a Caterpillar distributor, found its yard clogged with various items of used equipment it had taken in on trades. The company wanted to convert the equipment quickly into cash. It decided to sell out the yard in a hurry. There's one way to do that fast—and that's by public auction. Penn had auctioned off 75 pieces of equipment in 1955. With a new value of nearly $2 million, the equipment brought $239,000.

But some auctions of heavy construction equipment have come in for serious criticism in the past. Prospective buyers like them in theory; but they have become wary. They have attended auctions where the sales were held a considerable distance from the equipment to be sold; catalogue descriptions of the pieces to be auctioned often were inaccurate and misleading; minimum prices for equipment often were set in advance, so the sale was not a true auction at all.

The H. O. Penn auction was planned carefully to give buyers every opportunity to examine the equipment.

"Our first step," said a Penn spokesman, "was to turn over the actual handling of the sale to the Forke Bros., Lincoln, Neb., auctioneers. They've a reputation for honesty, a knowledge of equipment, and of the auctioning business." Penn used them on its previous auction and were well satisfied.

The Forke brothers have been in the heavy equipment auction business for more than 35 years, conducting sales throughout the United States and Canada. The four of them — Avery, Don, Herb, Dean, and two associates—Ed Ficke and Don Coy—are known and respected throughout the construction equipment industry.

Penn's deal with the auctioneers was simple. It would turn over the 103 pieces of equipment to the auctioneers to sell. The auctioneers would take a commission in the neighborhood of 5% of the gross sale and turn over the remainder of the proceeds to Penn.

The auctioneer's first move was to mail announcements to the more than 30,000 contractors and dealers on their mailing list. This is a circular announcing the auction, its date, its locations, and listing all pieces of equipment being offered for sale along with their descriptions.

The circular stated in addition that equipment would be available for inspection for a full week prior to the sale. The circular also listed terms and details of the sale. This announcement was followed up with newspaper and trade paper advertisements.

Carnival Atmosphere

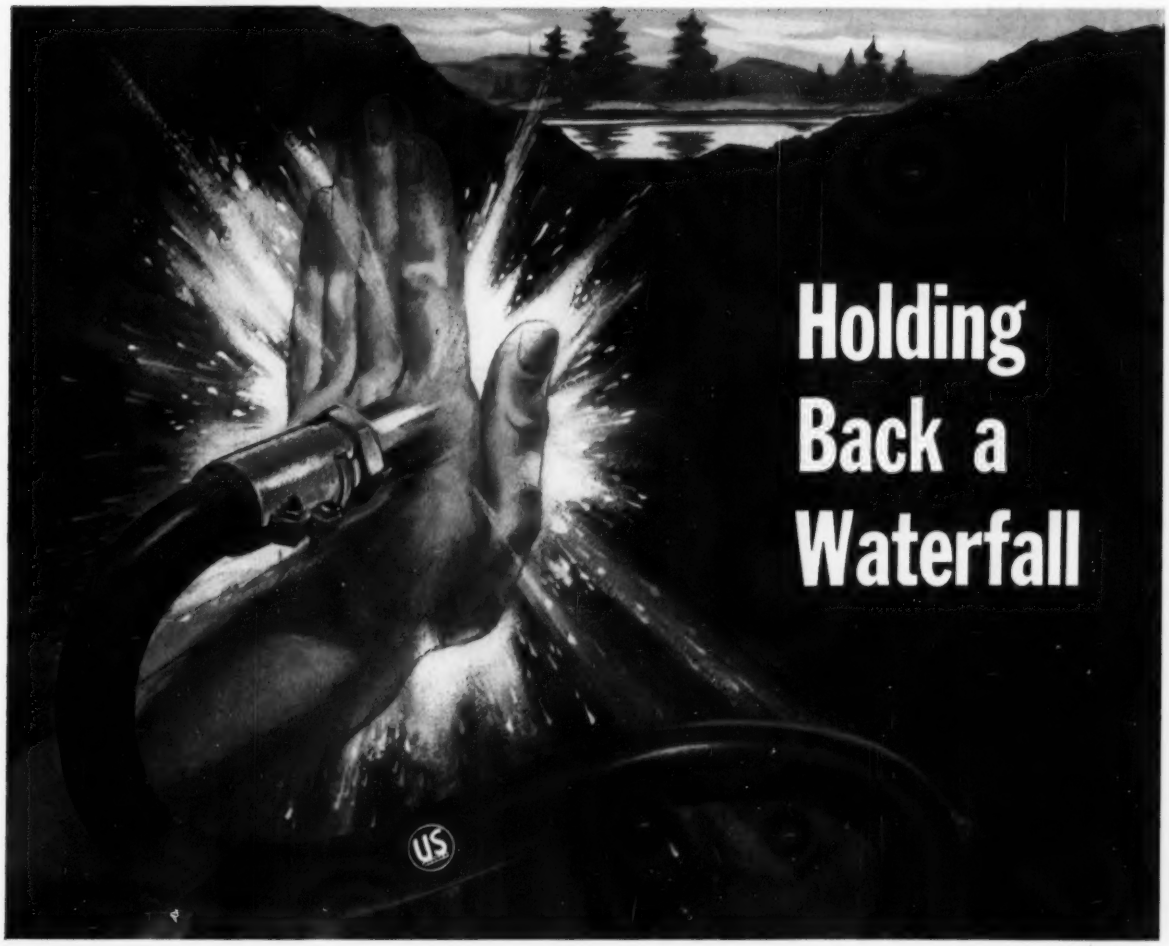
On the morning of the sale, Penn's equipment yard took on the air of a carnival. A hot dog stand moved in early to provide refreshments for prospective buyers. Trucking concerns set up tables to arrange for moving of equipment purchased to desired locations. All the equipment that was to be auctioned off had been numbered and placed in lines on both sides of the yard. Each number corresponded with a number listed in the catalogue issued to all who entered the yard.

In addition to the number, the catalogue listed the equipment's serial number, attachments, and a description of the rig's operating condition. Some equipment was described as good, some fair, some in operating condition, some not in operating condition.

Each catalogue had printed on it in bold face the statement that every piece of equipment positively would be sold to the highest bidder without any minimum, limit, or reservation. It further stated that "under no circumstances would H. O. Penn, its representatives, or the

continued on page 171

US RUBBER GROUTING HOSE



U. S. RUBBER PRODUCTS AT WORK ON THE 44-MILE WEST DELAWARE TUNNEL

What do you do when you're building a tunnel 320 feet below ground and, without warning, a cascade of 2000 gallons of water per minute pours down from the roof? That's what happened recently in the construction of the 44-mile addition to the world's largest tunnel system—the Delaware Aqueduct, supplying water to New York City.

When this unwelcome waterfall began, all work had to stop. In addition, the flow could not be sealed by the usual methods. So quick-thinking engineers decided to put a 40-foot concrete plug into the tunnel itself, and place the grout through the plug and into the roof. A single length of U. S. Grouting Hose, on hand from previous grouting jobs, delivered all the grout needed to hold back the waterfall.

On the eighth day, the waterfall was stopped and time and work schedules were resumed. The U. S. Grouting Hose, *as good as ever,* had delivered 16,000 bags of grout under 1000 pounds per square inch pressure, and had withstood the sudden surges, the heavy blows, and the incessant gouging of this emergency operation.

This is just one more example of how U. S. Rubber Hose is engineered for top performance under normal—and emergency—conditions. This special report about United States Rubber on the West Delaware Tunnel continues on the following pages.

US RUBBER

Mechanical Goods Division

United States Rubber

IN MUCK...

U. S. RUBBER PRODUCTS AT WORK ON

They are moving ahead at the rate of about 300 feet per day from the shaft headings and the West inlet heading of what will be the second largest tunnel job in the world—the 44-mile West Delaware extension of New York City's water supply system. The tunnel has a rough bore of 14 feet. When completed —in 1960—it will be finished to 11 feet 4 inches with its concrete lining.

Tunnel Progress

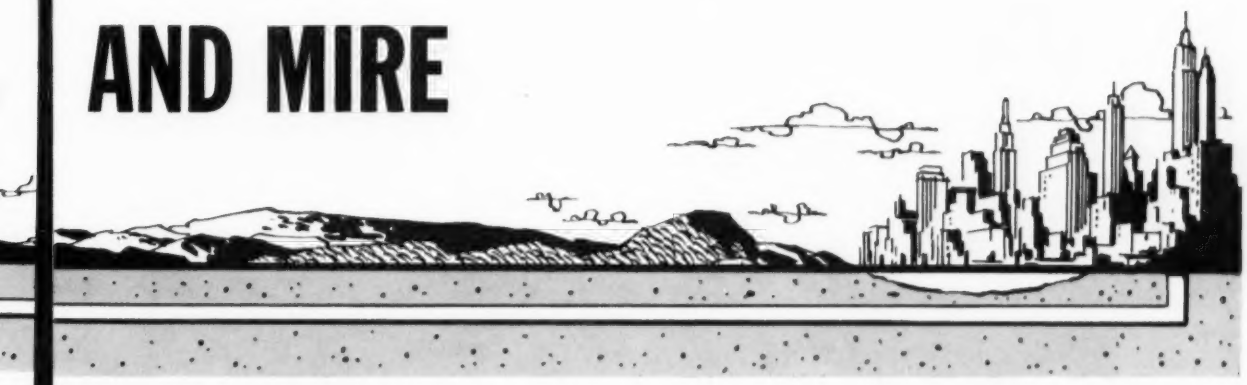
On the whole, the Cannonsville (N.Y.) end—the West end—of the tunnel is on schedule. Three shafts have been sunk to grade, turned horizontally, and about 8 miles of tunnel have already been dug from the three shafts and West inlet. These headings—five in all—are worked by 6-drill jumbo rigs cutting a 48-hole pattern into solid granite-shale and sandstone. Once the drill holes have been made and the charges have been detonated, mucking machines—equipped with U.S. Rubber's Matchless® Mucker Belts—are brought in to remove the loosened rock (see picture at left).

These muckers, like every piece of machinery below ground, are run by compressed air carried by U.S. Rubber's #4810 Air Hose. Two mucker machines are used per shaft, one operating at each face. The mucker cars are 5-cubic-yard cars, each holding six tons. Every foot of tunnel progress represents about two carloads worth of muck and each blast dislodges enough rock to fill 21 cars. Currently, the contractors are

"Red" Gatrell, Supt. of Shaft #2, pointing out the constant problem of water leakage to service engineers of U.S. Rubber on tour of the tunnel. Close and constant observation by "U.S." men of product performance is typical, and is one of the big reasons why U.S. Rubber products are engineered to the job, and outperform all others.

This is a 28", 4-ply (Style XN) cotton-nylon U.S. Matchless Mucker Belt in action near Shaft #2. The tough 3/8" top cover and 3/16" bottom cover resist moisture, abrasion, cutting and gouging. For added carcass protection against high impact and jagged rocks, special white cushion breaker ply of NYTON (a special nylon-cotton weave) "floats" in the top cover and lies between the bottom cover and the carcass.

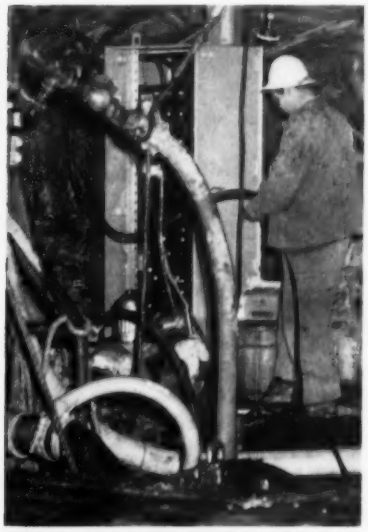
AND MIRE



THE 44-MILE WEST DELAWARE TUNNEL

averaging two blasts per shift on each heading. This is pretty severe service for both the U. S. Rubber belt and the mucking machine, yet from the very start, there's been no delay in the vital task of moving the shattered rock from the face and into the mucking cars.

Just about all the rubber products used by the contractors are made by U. S. Rubber—this includes literally thousands of feet of hose—for grouting, air, water and suction—several mucker belts, and quantities of electrical tape to splice the miles of wire and cable.



Here, at the bottom of Shaft #2, is an example of the maze of "U. S." air hose, water hose, suction and discharge hose that is used throughout the tunnel. Practically every foot of hose on this job is made by U. S. Rubber.

This on-the-spot photo shows U. S. Grouting Hose placing the 16,000 bags of grout needed to seal off a wet seam that had stopped all progress in the tunnel. U. S. Grouting Hose is perfectly balanced throughout, with an abrasion-resistant tube, a carcass constructed of multiple braids of extra-heavy wire, and a rugged cover to withstand external abuse.

Handling Water Leakage

Delays, of course, can mean real trouble for the several contractors who have combined resources on the first stage of this West Tunnel project—the $36 million contract for Shafts #1, 2 and 3 and the headings branching out from them. For example, the 2000-gallons-per-minute wet seam that they recently encountered halted progress completely. However, quick-thinking engineering skills—and equipment that stood up under rigorous emergency service—combined to cut the delay to the bone and kept the tunnel's time schedules moving as planned.

One thing is certain . . . there is always water seepage, hour after hour, day after day. For the most part, this presents no serious problem. The constant leakage is pumped out with the aid of U. S. Giant® Contractors Water Suction Hose and U. S. Bengal Water Discharge Hose.

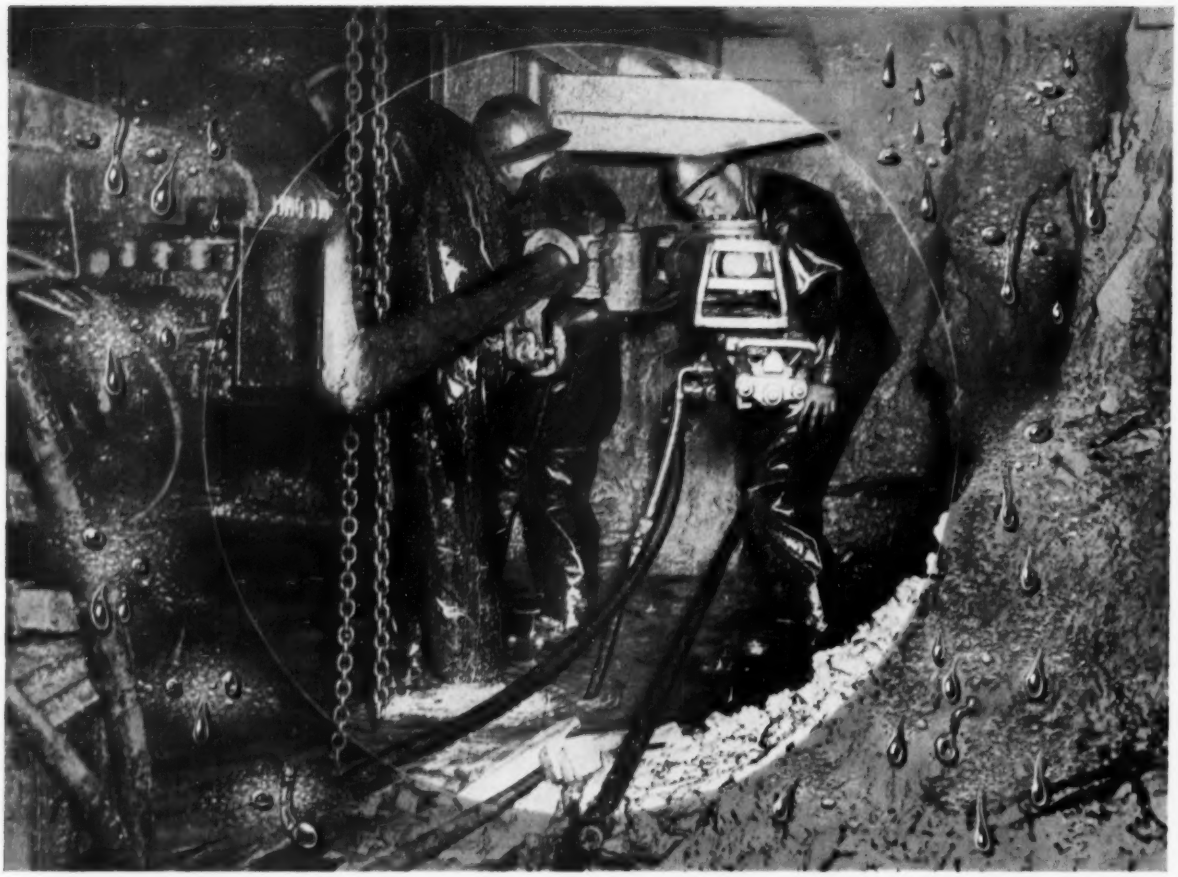
U. S. Giant Hose is particularly valuable suction hose for working in and around heavy equipment because this spring-steel hose can be rounded out when flattened or crushed. And mandrel-made U. S. Bengal Hose—with a tube of high quality rubber, a multiple-ply carcass of sturdy cotton duck, and an abrasion-resistant natural rubber cover—is the perfect water discharge hose for the heavy duty encountered on jobs like this.

US RUBBER

Mechanical Goods Division

United States Rubber

US RUBBER AIR HOSE



It's the Air that keeps things moving!

Deep under the Catskill mountains in Southern New York, thousands of feet of air hose snake along the wet, jagged rock passages of the West Delaware Tunnel project.

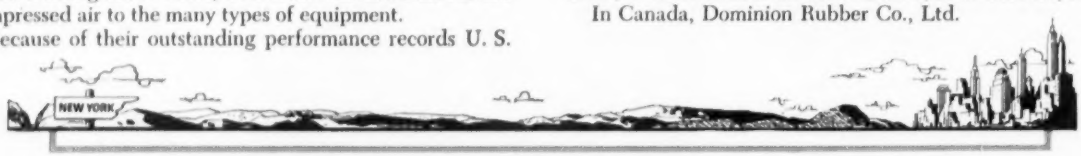
On this mammoth 160-million-dollar, 4-year construction job, everything below ground is run by compressed air (except, of course, the lighting). From muckers to exhaust fans, from suction pumps to jumbo drills, it's compressed air that *keeps things moving.* And every cubic foot of compressed air moves through U. S. Rubber Hose.

First, high-capacity U. S. Bull Line Hose carries the air to the working faces. Then, U. S. 4810 Air Hose moves the compressed air to the many types of equipment.

Because of their outstanding performance records U. S. Bull Line and U. S. 4810 Air Hose were selected by the several contractors involved. Both hose have covers of tough, pure-gum rubber to resist the severe abrasive conditions encountered. Both hose also feature neoprene tubes to combat action of oil in air lines. And between cover and tube, both Bull Line and 4810 have kink-resisting carcasses, each engineered for greatest hydrostatic values.

For all construction requirements, a complete line of rubber products—plus expert engineering assistance—is available at the 28 U. S. District Sales Offices, at selected distributors, or write us at Rockefeller Center, New York 20, N. Y.

In Canada, Dominion Rubber Co., Ltd.



U. S. RUBBER PRODUCTS AT WORK ON THE 44-MILE WEST DELAWARE TUNNEL

US RUBBER

Mechanical Goods Division

United States Rubber

CONTRACTORS who bought generally termed their purchases "bargains." These Venezuelan contractors posing with dealer (center) went home with ten machines.

The tractor sold for $600.

"Now this rig," Avery began, mounting a huge tractor. It was the heaviest in the line of one manufacturer. "The hydraulic system is shot. She won't steer, boys. I want you to know that. You'll have to put in a new hydraulic system to work her, or you can junk her for parts. Now let's begin—"

The tractor sold in two minutes for $1,250.

And that's the way the bidding went through the morning and into the early afternoon. A piece of equipment sold almost every three

AUCTION . . .
continued

auctioneers bid on any item up for sale."

Payment was to be made in full on the day of the sale for each item bought. Cashiers checks, bank drafts, or certified checks would be accepted. Payments by personal or company check would be honored with proper personal identification and a bank letter. Immediate possession of all equipment was required when proper settlement had been made.

The Auction Begins

At 10:30 a.m. on the day of the sale, Avery Forke, the man in the camel's hair coat, took a field microphone and portable speaker in hand and mounted the first piece of equipment to be sold—a small rubber-tired tractor shovel with a 1/3-yd bucket. The catalogue listed it as being in good condition.

"Now we'll start the ball rolling," Avery began in a clear, crisp, mid-western twang. "Who'll start the bidding?"

"A hundred dollars," somebody said in the crowd.

"Boys," Avery said. "We were gonna sell 'em cheap; but we didn't say we'd give 'em away."

"A hunnert'n fifty," somebody else in the crowd shouted around a mouthful of hotdog.

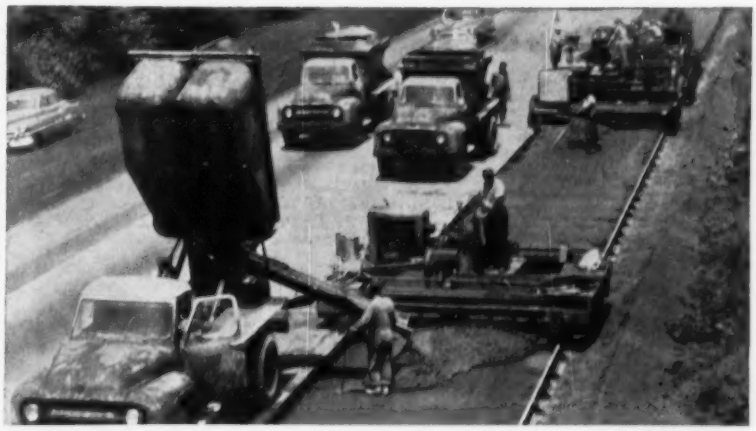
"Looks like we're gonna have to give it away. All right boys," Avery said. "We got one fifty, we're looking for two, two, two, do I hear two—"

"You got two," the first bidder shouted.

"Now we got two, do I hear—"

The bidding continued at a furious pace for all of three minutes.

DUMPCRETES help set records on GARDEN STATE PARKWAY



Villa Contracting Company and Weldon Contracting Company of Westfield, N. J., teamed up to average 5,080 lineal feet of 8 in. by 12 ft. concrete per day—to set a record of 7,980 ft. in 24 hours—using Dumpcretes. Contractors won bonus and still kept heavy traffic rolling over 13½ mile Jersey Parkway section during an intensive seven-week paving push.

SEND FOR FIELD REPORT ON THIS RECORD-SETTING PAVING JOB

Dumpcretes can reduce:
Capital investment in equipment • Confusion at paving site • Downtime and labor costs • Wide shoulder maintenance.

Dumpcretes can give you:
Lower operating costs • *Flexible* delivery to paving site *and* structures • Closer quality control • Better production.

MAXON CONSTRUCTION COMPANY, INC.
Manufacturing Division 13
2600 Far Hills Building, Dayton 9, Ohio

Please send me new Dumpcrete Field Report.

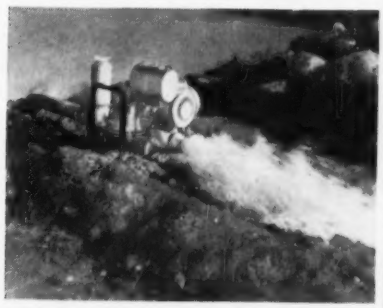
NAME _____
TITLE _____
FIRM _____
ADDRESS _____
CITY _____ ZONE _____ STATE _____

It Gets Around

You see it everywhere . . . in spots where other pumps couldn't reach or work. One man simply picks up and carries a Homelite Gasoline-Engine-Driven Pump. He sets it up where he wants it and starts it. That's all. Fast self-priming. 28 foot suction lift. Pumps anything from seepage to 15,000 gals. per hour . . . and non-clogging. No wonder you see more Homelite Pumps on more construction jobs than any other pump. A Homelite really gets around. Ask for a demonstration on your job.

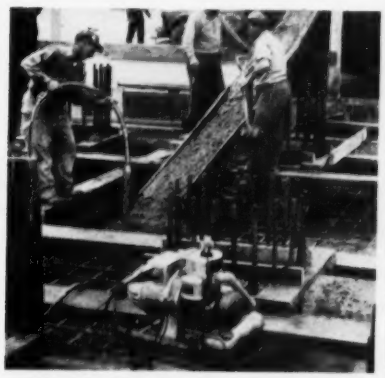
HOMELITE
A DIVISION OF TEXTRON INC.
1005 RIVERDALE AVE., PORT CHESTER, NEW YORK
MANUFACTURERS OF CARRYABLE PUMPS
GENERATORS · BLOWERS · CHAIN SAWS

Full Line of Carryable Construction Equipment Now Offered by Homelite



Carryable Diaphragm Pump . . . This self-priming, 120 pound diaphragm pump will handle water in the thickest sand, muck, or mud. Capacity: 5,000 g.p.h. Size: 3". Complete line of centrifugal pumps are also available in sizes from 1½" to 3".

Chain Saws For Every Job . . . Now you can choose from a full line of lightweight, powerful Homelite chain saws. From 3½ to 7 horsepower . . . 19 to 29 pounds. Brush cutting and clearing attachments are available to handle all your cutting jobs.



One-Man Electric Vibrator . . . It takes only one man to place concrete with powerful, Homelite high-cycle or universal electric concrete vibrators. Carryable Homelite generator provides power for high-cycle vibrators *and* 110 volt DC for all universal vibrators, tools and floodlights.

HOMELITE

a division of Textron Inc.

PORT CHESTER, NEW YORK

AUCTION . . . continued

minutes. Few of the people who came left before the auction finished. Hot dogs, hamburgers, soft drinks, and coffee sold at a prodigious rate keeping four people going in the chuck wagon.

Who were the buyers? Better than 80% of them were users — contractors or owner-operators. Another 20% were dealers who hoped to pick up a good buy, recondition it, and sell it.

Buyers came from all over the U. S., Canada, and even Venezuela. Two contractors, up for the auction from Caracas, Venezuela, will go home with two motor-scrapers and eight tractors they picked up.

Cash on the Line

Once a sale was concluded, the buyer went to Penn's adjacent office and made payment. This was received by Dean Forke, who issued the buyer a bill of sale.

Penn loaded some of the lighter equipment onto trucks free of charge. For heavier rigs, Penn charged on a cost basis. Much of the equipment was rolled to a nearby railroad siding. Truckers who set up shop on the auction site did a booming business. By late afternoon, a quarter of the equipment that had been in the yard that morning already was gone.

Buyer Reactions

What were buyer reactions to the sale? No one seemed dissatisfied. Prices paid for the used equipment seemed so cheap it mattered little what was the condition of the equipment.

"How can you go wrong," one man said. "You can get your money back just taking the machine apart and putting the parts on other rigs."

"If the rig I bought works three weeks it will pay for itself," said another. "Then I can break it up or throw it away—I'll still be ahead."

Did it seem a fair auction?

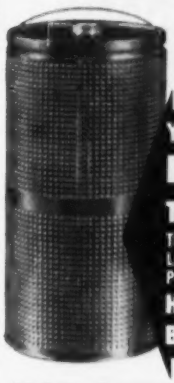
"You heard that guy Avery up there," said one buyer. "He made no secret of what he knew about the equipment. If it was a dog—he told you it was a dog."

Seller Reaction

Did the auction satisfy the Penn people?

"You bet your life," said a spokesman. "We've cleaned out our yard. We'll be able to put the money we realized to work selling new equipment. That's what we're in business for."

THERE'S NO SUBSTITUTE for LUBER-FINER'S ENGINEERED PROTECTION



YES! IT'S WHAT'S **INSIDE** THAT COUNTS

The Efficiency of Luber-finer's Exclusive Patented Process HAS NEVER BEEN EQUALLED!

USE ONLY GENUINE Luber-finer DIESELPAKS

Only a Luber-finer Unit *Plus* a Genuine Luber-finer Pack can give the Exclusive Patented Filtering Process that has made Luber-finer The Standard of The Industry Since 1936!!

THERE'S A LUBER-FINER MODEL FOR EVERY TYPE OF ENGINE— EVERY TYPE OF OIL!!

LUBER-FINER PACKS AVAILABLE

1. REFINING PACK

Introduced to the public in 1935 for use with straight mineral oils, fuel oils, hydraulic oils, and inhibited industrial oils.

2. DIESELPAK

First made available in 1941, the DIESELPAK was primarily designed for use with H.D. detergent compounded oils and has also achieved outstanding results when used with fuel oils and straight mineral oils.

DON'T BE MISLED BY PRICE ALONE!

There is no substitute for DIESELPAK'S Patented Filtering Process for H.D. Compounded oils AT ANY PRICE!

The DIESELPAK cleans more oil faster —keeps it CLEAN longer—and gives more service and better engineered protection than ANY of the substitute filtering elements being offered for Luber-finer units.

IT PAYS TO GET THE BEST!

STANDARD OF THE INDUSTRY SINCE 1936

Luber-finer Units are Standard and Optional Equipment on America's Leading Diesel Trucks, Tractors, Stationary Engines.

Write for Complete Information to Dept. 102

LUBER-FINER, INC.

2514 S. Grand Ave., Los Angeles 7

ON THE NEW INDIANA

American Welded Wire Fabric in the road...
Welded Wire Fabric-reinforced

CRACK CONTROL! Since it keeps the road surface smoother, American Welded Wire Fabric helps make the new Indiana Toll Road a *safer* road, as well as a better-riding and more durable road. American Welded Wire Fabric now comes in a complete range of wire sizes up to and including ½" in diameter, 2", 3", 4" and 6" on center.

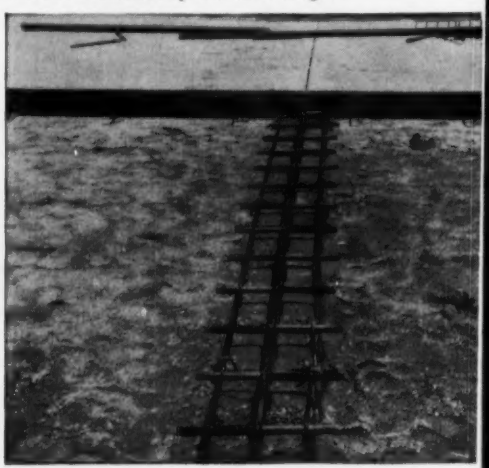
Why 95% of all toll roads are reinforced with steel!

LONGER LIFE –Distributed steel reinforcement, such as American Welded Wire Fabric, extends pavement life because it adds 30% to the strength of concrete slabs.

GREATER SAFETY –Steel Wire Fabric reinforcement controls cracking, keeps the pavement smooth and makes it safer to drive on.

LOWER COST –By extending pavement life and because Wire Fabric-Reinforced concrete pavements can be built with fewer joints, steel reinforcement reduces maintenance costs and lowers long-term cost of any concrete road.

SMOOTH RIDING! Specially designed American Road Joints were used on the Indiana Toll Road to keep the long slabs in proper alignment and provide an especially smooth ride. These joints assure adequate load transfer for a balanced pavement design.



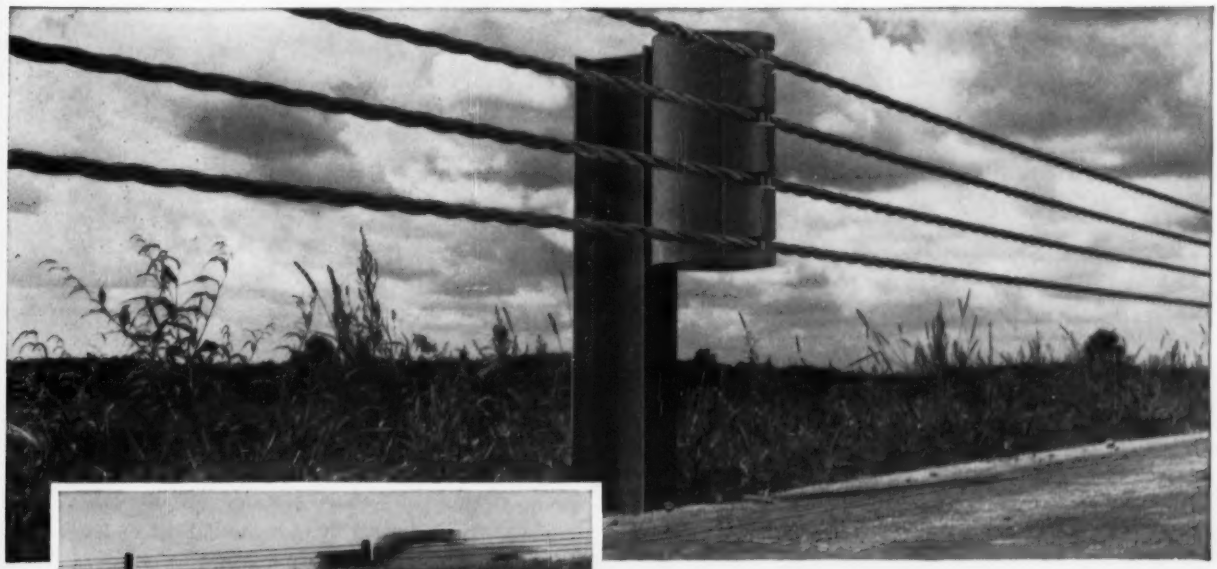
USS American Welded Wire Fabric
USS Multisafty Cable

USS

UNITED STATES STEEL

TOLL ROAD...

Multisafty Cable Highway Guard along the road... concrete pipe under the road!



SAFETY, OFF THE ROAD! It is impossible to prevent accidents completely. But here is one way to minimize damage—and injuries: Install American Multisafty Cable Highway Guard along the side of the road, as they did here on the Indiana Toll Road. It is the only guard rail sold that was designed for definite miles-per-hour protection based on extensive testing. The combination of resilient steel cables, plus spring-steel offset brackets, cushions the shock of any collision, and restrains the vehicle, too. American Steel & Wire also makes beam-type highway guard.

GOOD COMBINATION! Portland cement concrete and Welded Wire Fabric reinforcement have been for many years, and remain today, the best and most economical and durable combination of materials for culverts, sewers, and force mains. Wire Fabric Reinforcement gives the concrete culverts on the Indiana Toll Road the greater strength needed for long life.

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL, GENERAL OFFICES: CLEVELAND, OHIO

COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

NEW TECHNICAL LITERATURE

The catalogs and brochures describing the uses and advantages of the various construction materials made by American Steel & Wire have been revised and brought up to date. You need the data in these booklets, if you use or build with concrete. Send for your free copies.

Highway Guard

American Steel & Wire
Dept. 4B-57, Rockefeller Bldg.
Cleveland 13, Ohio

Please send complete information on the following products:

☐ American Welded Wire Fabric for Portland Cement Concrete ☐ American Welded Wire Fabric for Asphaltic Concrete ☐ American Welded Wire Fabric for Airport Runways ☐ American Road Joints ☐ Multisafty Cable Highway Guard ☐ American Beam-type Highway Guard ☐ American Wire and Strand for Prestressed Concrete

Name .....

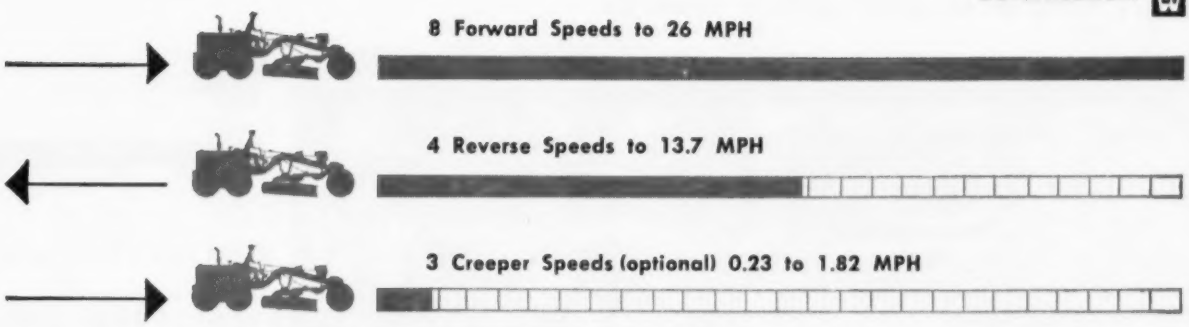
Firm .....

Address .....

City ..... **State** .....

Adams* 15 SPEEDS

...give you more to put extra $



GO-power in your pocket

Profit . . . that's what you work for . . . and that is what you expect from your investment in earthmoving machines.

Every yard of extra material you move . . . *at no increase in cost* . . . puts extra dollars in your pocket. And if you move *more* material . . . at even *lower* cost . . . you're better off than ever!

You can expect *better-than-ever* results from modern Adams motor graders. Leveling fill, cutting ditches, shouldering, mixing, maintaining . . . with these rugged, high-speed machines you'll do more work, in less time, and make more profit.

John M. Rufo, Vice President of Rufo Construction Co., Boston, Mass., says, "When slow steady blading is needed, the Adams works slow without sacrifice of power. When fast secondary passes are made, no other machine can touch its speed. It definitely has greater pushing ability . . . practically eliminates the need for a bulldozer on a road graveling job."

You get up to 28% bonus blade-work

The 8 forward speeds in Adams graders give you up to 28% bonus blade-work. For example, an Adams 550, working alongside other graders in the 115-125 hp class, takes a big cut, pushes a full blade of dirt, at 4.6 mph. Other graders do not have this speed. When full power is needed, they have to shift down to the next lower gear, 3.6 to 4.0 mph . . . work 1.0 to 0.6 mph slower than the Adams. By comparison, on jobs requiring extra *GO-power*, the Adams produces up to 28% more work. This extra production is FREE, because Adams 8-speed transmission costs no more.

Your heavy-duty Adams gets to the job sooner, and works later, because it travels at speeds to 26 mph . . . an advantage of nearly 5 mph over other graders. This saving can mean about 10 minutes a day. If translated in extra work time, it can mean 4 days' bonus production for you in a year's operation.

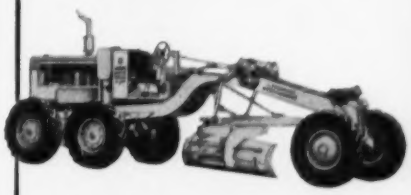
Works always at fastest practical speed

With 8 forward speeds, 4 reverse speeds, and 3 creeper gears (optional) . . . a total of 15 speed ranges . . . your Adams operator can work his machine always in the most practical gear. The result is more work done, more jobs completed on schedule, *more $ in your pocket.*

You get up to 27% more production on shuttle grading

Most graders have only reverse gears, with speeds to 7 mph maximum. Adams has 4 reverse gears . . . 2 for blading, 2 for high-speed back-up, ranging to 13 mph. You need these high reverse speeds to cut non-productive time on shuttle operations. The Adams backs up to its starting point fast, converts otherwise wasted reverse travel time to extra passes and profitable production.

Compare Adams to a grader having top reverse speed of 6.3 mph. On a 400′ forward operation, with each grader moving at 4.5 mph, the blading pass takes 61 seconds. Backing to the starting point, the Adams reverses at 13 mph, returns in 21 seconds — the other grader reverses at 6.3 mph, returns to the beginning of the cut in 43 seconds. The Adams *saves 22 seconds* on each 440′ cycle. No matter how long the cycle, at these speeds the Adams can make 27% more cycles . . . do 27% more blade work . . . return bigger profits on your investment.

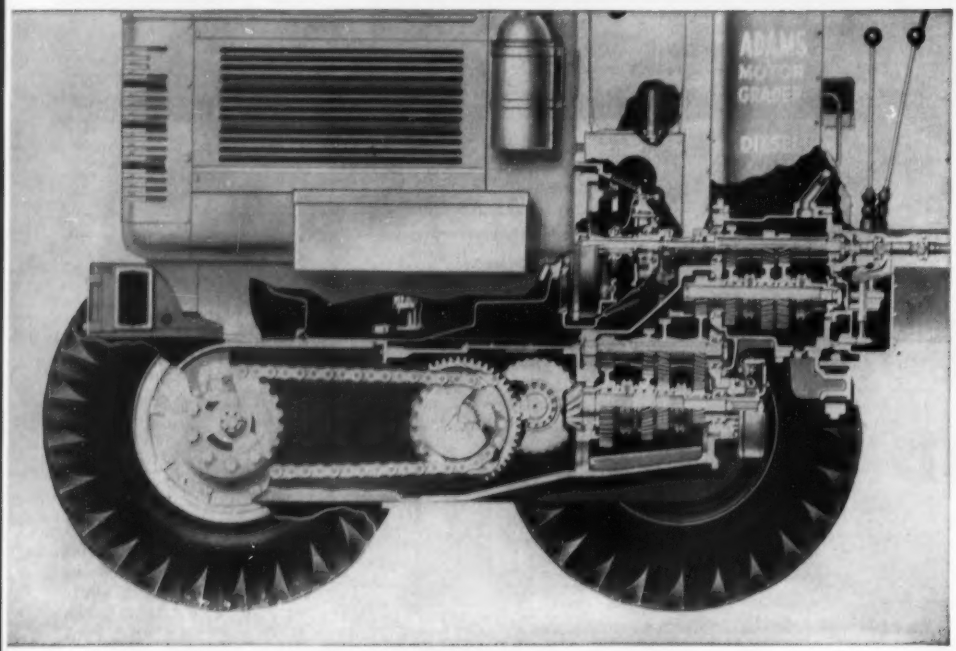


NOTE: Speed ranges mentioned here apply only to Adams heavy-duty Models 660, 550, 440, and 330, with constant-mesh transmission. Other models include the big 190 hp POWER-*Flow** 660 with torque converter, and the 60 hp utility Adams Model 220, with hydraulic controls.

*Trademark

turn page for more on **GO-power**

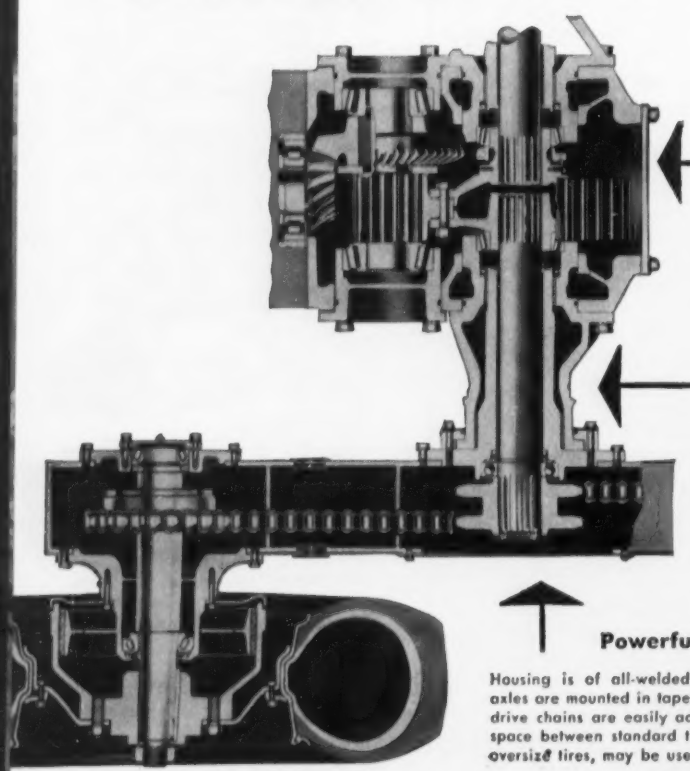
. . . more $ in your pocket (cont'd)



Designed and built for hard work and high efficiency, this heavy-duty constant-mesh transmission is available only in Adams graders. Precision-cut, helical gears are crown-shaved for true mesh and quiet operation. Shafts and gears turn on ball-, needle-, and roller-bearings. There are no bronze bushings to bind with heat and wear. All moving parts in both upper and lower transmission cases are fully lubricated with individual oil supplies.

GO-power . . . in heavy-duty final-drive with full-floating rear axle

Engine *GO-power* is transmitted quietly through the Adams constant-mesh transmission and husky final-drive to full-floating drive axles. There is practically no friction . . . no power loss. In this construction, maximum power is delivered from engine to tandem drive-wheels. You get greater *GO-power* . . . greater operating efficiency . . . more work done! And your Adams grader retains its high-operating efficiency over more years of tough service under all working conditions.



Absorbs load shocks

Heavy gears and bearings assure long life. Bull gear hub is mounted in heavy-duty roller bearings for permanent support and alignment. Housing is extra heavy to withstand torsion and load shocks.

Axle carries no weight

Sturdy, tubular-shaped axle carrier housings connect transmission case with tandem case, on each side of grader. Housings carry all the weight . . . permit tandem wheels to oscillate freely. Driving axle floats on anti-friction bearings.

Powerful tandem drive

Housing is of all-welded box-type construction. Large driven axles are mounted in tapered roller bearings. Long-lasting roller drive chains are easily adjusted for tension. There is plenty of space between standard tires and tandem case. Tire chains, or oversize tires, may be used without danger of binding.

100%

anti-friction drive gives you top efficiency...more *GO-power* ...puts extra $ in your pocket

One reason why Adams* heavy-duty graders give you more *GO-power* is because these carefully-built machines deliver a greater proportion of developed engine-power to drive-wheels. You get this bonus work-power because all gears and shafts in transmission, final-drive, and tandems turn on smooth-running anti-friction bearings.

Because the Adams power-train has anti-friction roller- and ball-bearings throughout, minimum horsepower is lost through friction. *More thrust* is made available for pushing bigger loads... for blading deeper... *working faster*. And with this efficient anti-friction drive your fuel cost is correspondingly lower. You get longer bearing life, less maintenance expense, less downtime for repairs... more usable power at less cost... to take advantage of the wider speed ranges available in Adams motor graders.

"When you hit something solid you don't tear-up this grader!" That's what owner F. M. Moyer, of Moyer Construction Company, Staunton, Virginia, says about his Adams 550, equipped with creeper gears. Mr. Moyer was building 6.2 miles of 24' roadway for the new State Highway 635, linking Hume, Va., with U.S. Route 522, to the west. Here his "550" worked with a spread of other machinery, for the Virginia State Department of Highways.

On this job the Adams grader sloped banks, cut ditches, elevated curves, and bladed surface; grading an average of 1,000' of roadway per day. Ordinary work was handled in 1st and 2nd gears (2.2 and 3.2 mph). Where rock was encountered, the operator shifted to one of 3 creeper gears... using *full engine-power at speeds as slow as 34 ft. per minute (.39 mph).*

Commenting on the Adams grader, owner Moyer said, "I especially like two things about my grader... the power-shift moldboard, and creeper gears. Particularly like the creepers, because they give you full horsepower at slow travel. When you hit something solid, you don't tear-up the grader. Foot accelerator is very handy, too."

turn page for more on **GO-power**

*Trademark

POWER-Flow* 660

190 hp diesel engine† and torque converter. Infinite gear ratios, with forward speeds to 27.4 mph, reverse to 24.4 mph. Power is always matched to load for greatest efficiency. Biggest, fastest grader in the Adams line. Weight, 30,200 lbs.**

6 high-speed with GO-power

Somewhere in this Adams line-up is a grader of the right power and weight to handle your work with greatest speed and economy. To help you decide, let us send complete details and specifications. And for conclusive proof of Adams' ability to increase your profits, ask your LeTourneau-Westinghouse Distributor for a demonstration. No obligation! Call or write today.

Model 220

60 hp diesel, with hydraulic controls. Gives *big-grader* performance at low investment. An ideal tool for light maintenance and construction, grading between forms, leveling around foundations, spreading topsoil, and for building driveways. Weight, 15,000 lbs.**

Model 660

An extra-heavy-duty machine with 150 hp diesel engine†. A big grader, with power and stamina to keep ahead of your heavy hauling units, leveling fill. Weight, 30,050 lbs.**

Model 550

Heavy-duty, all-purpose tool, with 123 hp diesel engine†. Has the power and speed to outproduce any grader in its class. Use it anywhere to your profit. Weight, 26,320 lbs.**

Model 440

A sturdy, general-purpose grader, with 115 hp diesel engine†. Ideal for haul-road maintenance and clean-up, but heavy enough to do good work terracing, smoothing shoulders, and leveling fill. Weight, 24,080 lbs.**

**Weights shown are usual working weights.
†Choice of General Motors or Cummins diesel engines.

Adams* graders

to put extra $ in your pocket

Model 330

A high-speed worker in the 80 hp class. Used widely for finish leveling and spreading in light construction, and for general maintenance. Diesel engine†. Weight, 23,020 lbs.**

Elegrader

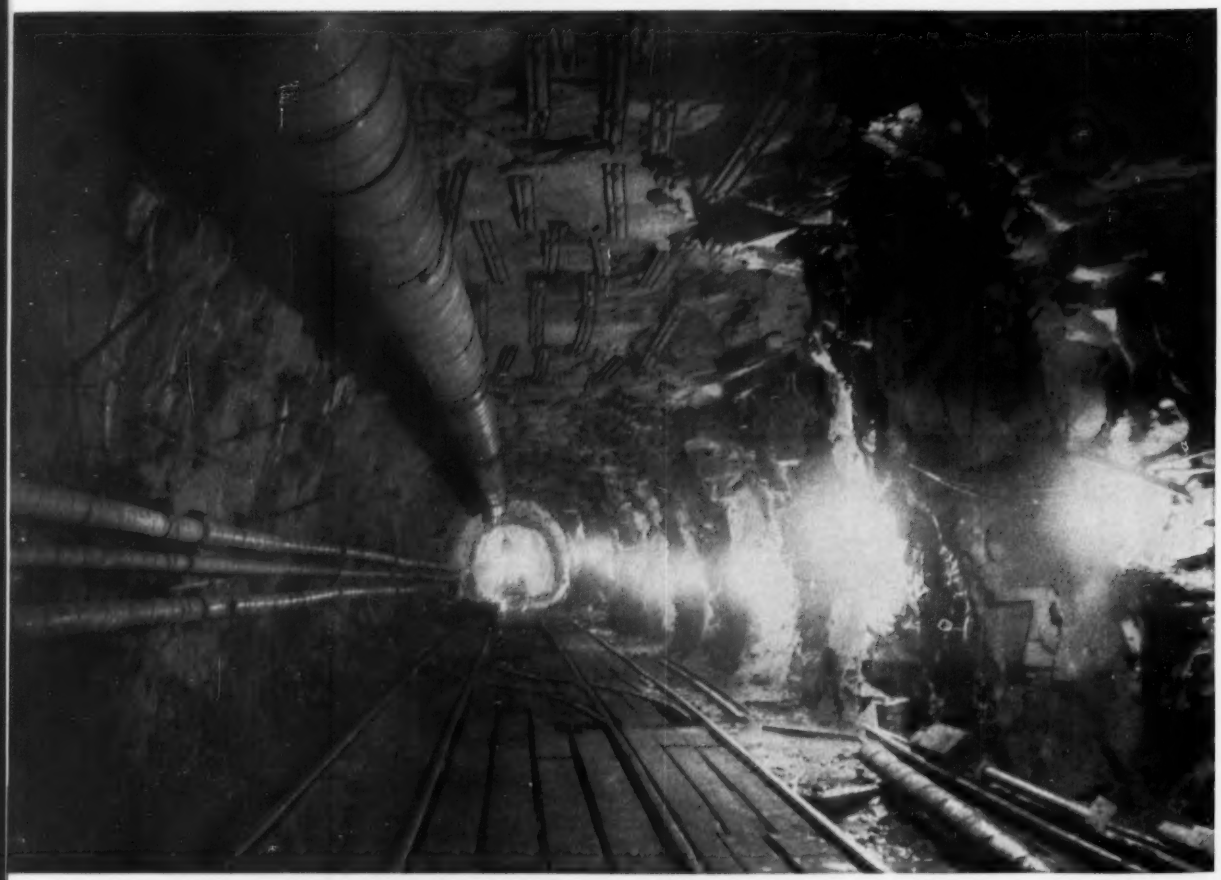
Plows and casts material, or loads into trucks. Side-casts 700 to 1500 cu. yds. per hr.; loads into trucks 400 to 800 cu. yds. per hr. Driven by PTO. Available for use with Adams 660, 610, 550, 440, Caterpillar No. 12, and Adams POWER-Flow 660 grader models.

*Trademark AG-1433-G

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit



ENLARGED SECTION of tunnel near base of shaft accommodates double track for car switching. Overhead pipe handles ventilation. Wall pipelines carry water and compressed air.

Bold Management's New Methods Drive Long Tunnel at Record Pace

By ALBERT C. SMITH,
Associate Editor

NEW YORK CITY'S vast water supply system throughout the years has made a lot of big league tunnel history. And the way things are going at the new West Delaware Tunnel, another significant chapter is being recorded.

The big story at present is the 19-mi section beginning at Cannonsville Reservoir. Only 18 months old, the job is one of the most modern, efficient hard-rock tunneling operations in the country.

In the last four months, working five headings on a five-day-week schedule, the joint venture firm of Drake-Grafe-Winston-Tecon-Conduit has driven 5 mi of 13-ft dia tunnel. Daily quota for each shift is two rounds; as soon as they make it—regardless of the time of day—they go home. Production is better than 60 ft a day per heading, and that's a good deal more than anybody else has ever done in the shale and standstone of the rugged Catskill Mountains.

How do they do it? It's a combination of methods and management. Besides excellent organization, the job benefits from smooth labor relations, good housekeeping, smart incentive plans, a top-notch safety program, modern equipment, and a host of new tunneling methods. Many experiments have been tried, and significant advances have been made in mechanizing shaft-muck handling, burn-cut full-face drilling, roof bolting, and plant facilities.

Last but not least is the psychological factor. Bidding $7 million low on a $36 million job has put everybody on his toes. At all levels of management the watchword is efficiency. Men are indoctrinated to make every move count, forget that it's a five-year job, be stingy with seconds, and make it the best tunnel ever driven.

Last month, the contractor got his reward. Not only was the job running smoothly, but he became successful bidder on the final

BETTER APPEARANCE is achieved with the help of Atlas Mortar Cement in new men's dormitories at Valparaiso University, Valparaiso, Ind. According to Masonry Foreman James S. Sedan, "This is the best mortar I have ever used —has remarkable workability and stays workable." Project architects: Hare & Hatch, New York; Contractor: Hagerman Construction Corp., Fort Wayne, Ind.

Modern masonry for modern design laid with ATLAS* MORTAR Cement

- Better mortar workability characteristics are the basis for better masonry.
- Field reports confirm that Atlas Mortar contributes to excellent workability, high yields, and weather-resistant masonry.
- Quality-controlled manufacture of Atlas Mortar promotes uniformly good performance and appearance. (Complies with ASTM and Federal Specifications.)

For further information, write Universal Atlas, 100 Park Avenue, New York 17, N. Y.

UNIVERSAL ATLAS CEMENTS

USS

®

M-64

UNIVERSAL ATLAS CEMENT COMPANY—member of the industrial family that serves the nation—**UNITED STATES STEEL**

OFFICES: *Albany · Birmingham · Boston · Chicago · Dayton · Kansas City · Milwaukee · Minneapolis · New York · Philadelphia · Pittsburgh · St. Louis · Waco*

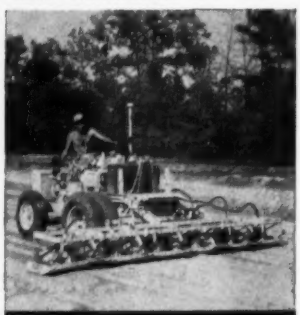
A FAR MORE POWERFUL, FASTER AND EFFICIENT JACKSON VIBRATORY COMPACTOR

Combines all the versatility and wide adaptability features* that contributed to making the present JACKSON VIBRATORY COMPACTOR the predominant compacting medium on nearly all major paving projects! By all means get the complete facts concerning this new machine before making any commitments! Write today for literature which will soon be available!

There are more Jackson Vibratory Compactors in use than all other makes of pan-type compactors combined.

JACKSON VIBRATORS, INC.
LUDINGTON MICHIGAN

* ADAPTABILITY FEATURES OF PRESENT JACKSON COMPACTOR WHICH WILL ALSO CHARACTERIZE THE NEW MACHINE.



6 COMPACTING UNITS in workhead for maximum coverage.

2 COMPACTING UNITS in twin hook-up self-propelling. One man readily compacts up to 4,000 sq. ft. per hour in 10" layers.

1 COMPACTING UNIT fitted with operating handle and narrow base. Just right for the otherwise unreachable spots.

3 COMPACTING UNITS in tandem and staggered. One of many hook-ups to exactly suit conditions.

4 COMPACTING UNITS just fit this widening job. Change required only a few minutes.

One Portal and Three Shafts

INTAKE PORTAL at west end of job is 6 mi from Shaft 1. Long haul to heading is handled by 15-ton capacity diesel locomotives with torque converters. Track is 30-in. gauge.

DEEP EXCAVATION through overburden replaces normal shaft sinking methods.

WEST DELAWARE TUNNEL . . . continued

20 mi of the West Delaware Tunnel. And this time his pencil was a lot sharper. In fact his total bid of $44-million was only $250,000 under the next lowest. The new job gives him a better unit price to work with and allows him to exploit the methods and equipment he has developed.

Good Management

Both management and labor are young, zestful, and progressive. Faced with a shortage of miners at the beginning of the job, Drake recruited young men from local towns and put them through vigorous training. It's paid off, too. They're geared to working the way the contractor wants. And they're never reluctant to test one of his new methods or devices.

Besides specific methods training, the youthful crews are taught to work neatly and safely. The job is a model of good housekeeping. Equipment is clean and well maintained, and both the surface and the tunnels are clear of debris.

An excellent safety record is the result of management's accident prevention program. Besides periodic safety meetings, courses in first aid are available to all men. And to make sure they are well attended, the contractor pays for all time spent in class. The effect on morale is obvious. The training already has paid off a number of times, both on and off the job.

TEMPORARY HEADFRAME at Shaft 3 lowers battleship bucket after dumping. Concrete for shaft wall lining is batched in Binnabatch, transferred to mixer, and chuted into bucket.

Shaft Sinking

Drake's contract with the Board of Water Supply calls for sinking and lining three circular shafts and driving and lining 19½ mi of tunnel.

Crews moved in during December, 1955, and started work at three points—the west portal, 520-ft Shaft 1, and 320-ft Shaft 2. At both shafts, 25 to 40 ft of overburden first was excavated by clamshell. Steel liner plates were set in place as excavation progressed. At Shaft 3, however, a side-hill slope made it possible to save time by first making a 60-ft open cut with shovels and dozers to bedrock. Liner plates then were easily erected from the rock up, and the shaft was lined with concrete and backfilled. Conventional methods sunk the shaft the remaining 400 ft.

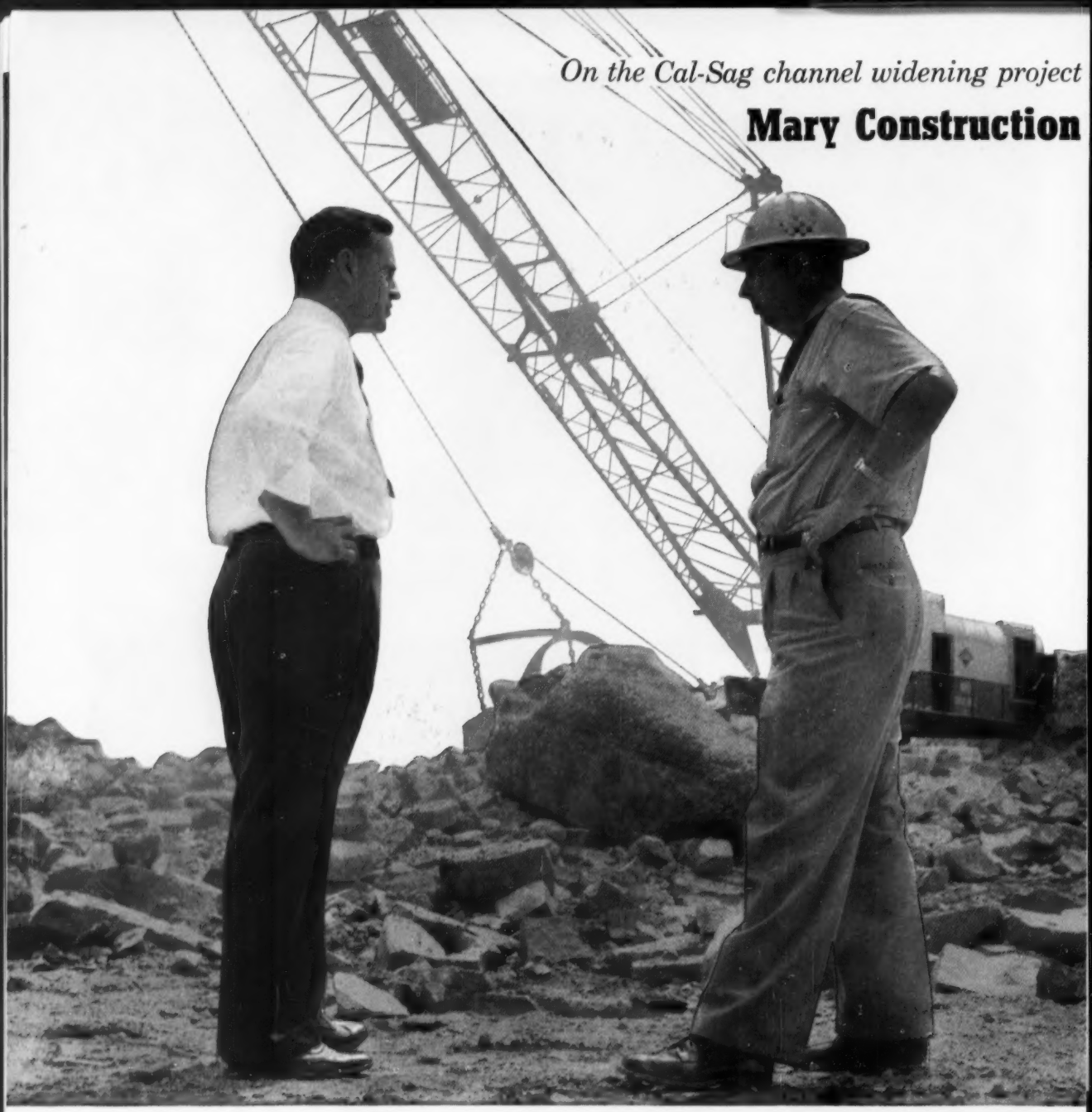
All hoisting for the first 100 ft of all shafts was handled by crane. Beyond that point temporary headframes were erected to carry on through the remaining depth.

Drilling was done with jackhammers operating from an air manifold. About 60 holes were drilled 10 ft deep for each shot.

continued on page 188

On the Cal-Sag channel widening project

Mary Construction



Adamec and Garms watch Lima dragline in action. Helping customers with the lubrication of equipment such as this is something for which Steve Adamec is well fitted. Steve has a mechanical engineering degree from Purdue. He has been providing technical service to Standard customers for 10 years. Steve is a graduate of the Standard Oil Company Sales Engineering School.

Project Superintendent Bill Jordan and Ray Elgas lay out schedule for servicing Page dragline. Page has 9.5 yard bucket, is powered by Page ½ vertical V6,700 h.p. diesel.

gets the job done

...uses STANDARD Fuels and Lubricating Oils

In 565 days, Mary Construction will widen 3.5 miles of the Cal-Sag ship channel. The channel will be widened to 225 feet from its present 60 foot width. To do this, Mary Construction will move 2.8 million yards of dirt and rock. Big job. Big need for service on gasoline, diesel fuel, lubrication oils. Mary Construction buys from the Standard Oil Company.

This is why Irvin Garms, general superintendent, and Bill Jordan, project superintendent, decided on Standard Oil products. First, they knew they would get products of top quality . . . products that meet or surpass the equipment manufacturer's recommendations. Just as important, they knew they would get service. Standard's bulk plant is only four miles from the project. Deliveries are made twice daily. In the early stages of the project, additional deliveries were made at midnight and at 8:00 a.m. Additional emergency trips were frequent at first, but with the delivery point only four miles distant, there was no strain.

With this service came another important Standard Oil plus—Standard Technical Service. Men experienced in rendering such service to contractors were assigned to the project from Standard's Joliet Division office only a few miles away. Ray Elgas and Steve Adamec, lube specialist and Chief Automotive Engineer respectively, spend hours at the site helping make sure equipment is never down for lack of lubrication or service.

Want this kind of service on your job? You can get it anywhere in the 15 Midwest or Rocky Mountain states. Call your nearest Standard Oil office. Or write, Standard Oil Company, 910 S. Michigan Ave., Chicago 80, Ill.

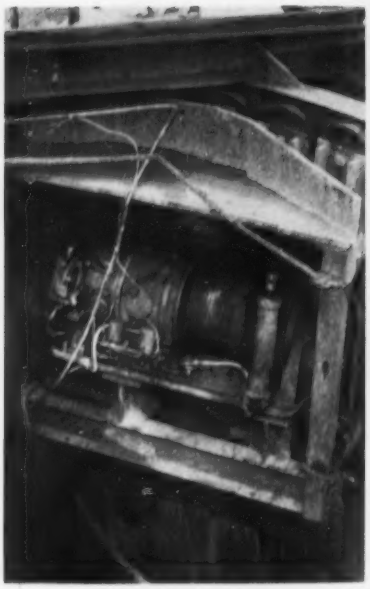
Steve Adamec, Standard Oil Chief Automotive Engineer, and Irvin Garms, General Superintendent for Mary Construction, discuss lubrication of Lima dragline. Lima unit, one of two draglines on the job, is powered by Caterpillar D-397 engine.

Ray Elgas (right) gets some facts about Cat operation from operator Scotty Cummings. For more than 12 years, Ray has been helping automotive customers with lubrication technical service. He qualified for this work after completing the Standard Oil Sales Engineering School. Ray also attended the University of Nebraska.

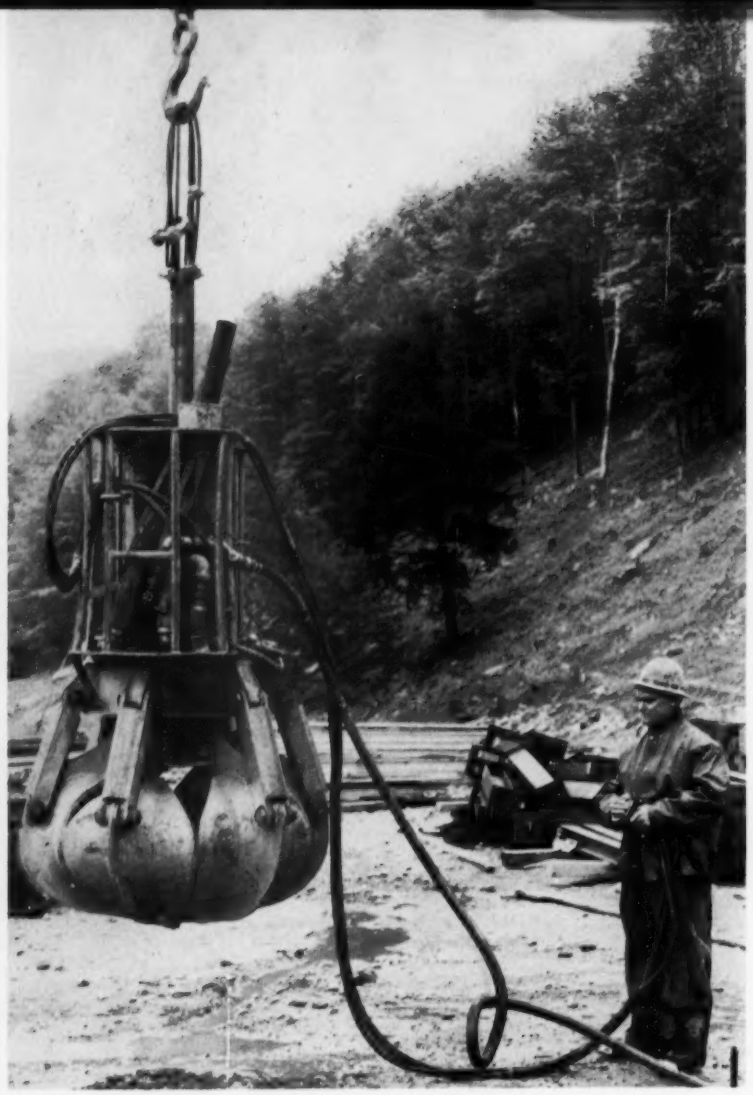
STANDARD

STANDARD OIL COMPANY
(Indiana)

Orange-Peel Grapple Speeds Shaft Mucking



RIDING circular monorail at top of shaft is Joy hoist from which grapple hangs.



AIR-POWERED Joy grapple with six-orange-peel tines is closed by worker operating remote-control panel. Rig takes big bite of muck and holds on to it until dumped.

MINERS hoisted from shaft bottom wait in bucket until cover is rolled over hole.

With a conventional pyramid cut, they pulled about 8 ft.

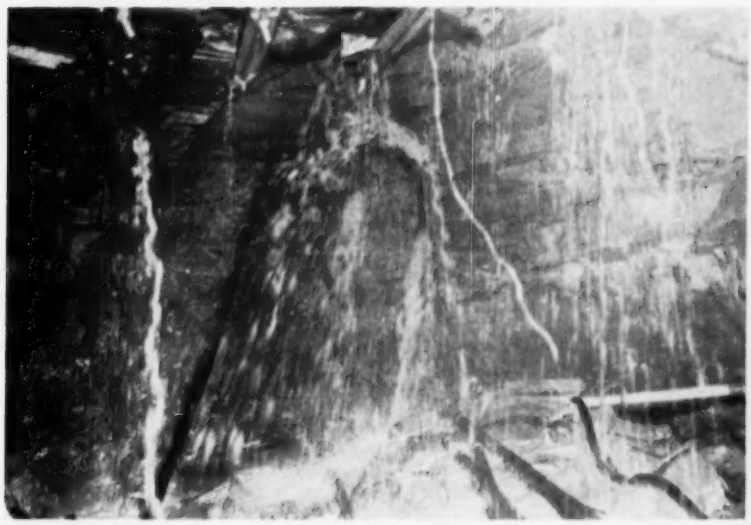
New Shaft Mucker

The real time-saving was in the mucking. Instead of hand or air-powered clamshells, they introduced a new Joy grapple. Basically, it consists of six orange-peel tines that are opened and closed by a large central air cylinder.

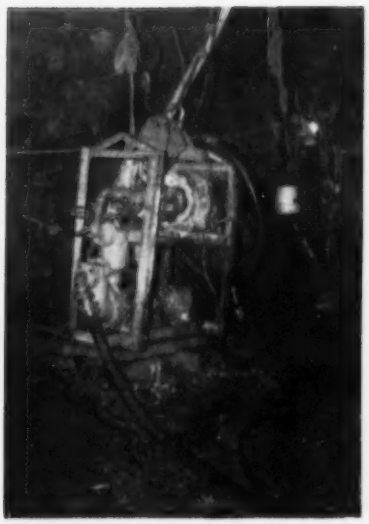
In the shafts, the grapple hung from a Joy air hoist which rode on a circular monorail at the top of the shaft. With a remote control push-button panel, an operator at the bottom of the shaft could raise and lower the grapple, open and close the tines, and move the unit around the shaft. The hoist, however, was not required to swing the loaded grapple over the muck bucket. Because of the long length of cable, this was done by hand at the bottom of the shaft. Generally, a normal pull on a rope was adequate. The grapple proved its worth because of its speed and capacity. It took a sizable bite of muck, and what's even more important, it did not lose it when lifted.

Another job innovation was the use of clamshell-like battleship buckets. The conventional round bucket for shaft work normally is dumped by tipping with a chain that hooks into a ring underneath. Wet muck often cakes inside a closed-bottom round bucket, and it is difficult to remove. But a battleship affords easy access to the inside for cleaning.

Bucket dumping was fast. When the full bucket reached the top of the headframe, a worker stationed on a platform reached out and hooked a bull line into a ring on the ball. The other end of the line was fixed to the headframe so that



WATER POURS from wet seams exposed by blasting in heading near Shaft 2. Normal grouting here was inadequate. Concrete plug first had to be placed and grout pumped behind.



SHAFT PUMP consists of LaBour self-priming sump pump discharging into I-R centrifugal.

when the bucket was lowered it would swing automatically over a hopper inside the headframe. At this point, workers hooked two lines into rings on each side of the bucket. Connected to an air tugger, the two lines jerked open the bucket, and the muck was discharged. The procedure then was reversed, and the bucket was ready to be lowered down the shaft. No bucket guides were required so the contractor employed a non-rotating cable.

During dumping, a sliding door was closed over the top of the shaft to prevent muck from falling in.

Shaft Lining

The drill-shoot-muck operation was interrupted long enough after each 100 ft of excavation to line the rock walls with a minimum of 6 in. of concrete. All utility lines were embedded in the lining.

Drillers normally shot one round beyond the 100-ft depth. But they did not remove the muck. Instead, the surface of the pile was leveled to support the liner forms. This method had the added advantage of making it simple to resume shaft sinking after the walls were lined. It would have been difficult to drill and shoot the rock immediately under the concrete. But by shooting first, shaft sinking was resumed by simple mucking.

Concrete lining 100 ft deep was always placed in one pour. Starting at the bottom of the shaft, Blaw-Knox steel forms, 10 ft high and four to a ring, were built up as the pour progressed. Concrete was lowered by bucket and chuted behind the forms. As soon as each 10-ft lift was completed, a new ring of forms was lowered into the shaft, positioned, and poured.

Eight hours after the entire length of lining was poured, the forms were removed from the top down, and shaft sinking was resumed.

Normal amounts of water were encountered at Shafts 1 and 3. It was removed by a pump suspended from an air tugger at the top of the shaft. Before a round was fired, the pump was hoisted out of danger. The unit required no booster pumps to help lift the water to the top of the deep shafts. Actually, it consisted of two pumps —an electric LaBour self-priming sump pump discharging into an Ingersoll-Rand 2-in. centrifugal pump. For easy handling, the two units were mounted together in a steel frame.

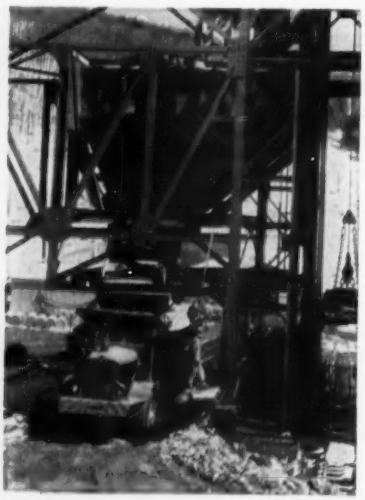
At Shaft 2, excess water inflow occurred four times, but it was sealed quickly by grouting. A lot

PORTABLE COMPRESSORS supply air to drills during shaft sinking. When headings are turned, air-leg drills push tunnels until permanent equipment is installed.

Towering Headframes Control Shaft Traffic

SHAFT 1 headframe rises 150 ft. Superior hoist operates skip-cage combination at 350 fpm. Here, skip-cage is at bottom of shaft, and its counterweight is in headframe.

MUCK CAR tilted by pneumatic arm dumps into skip at pit in shaft bottom.



EUCLID is loaded under hopper with muck. Skip dumps automatically in headframe.

WEST DELAWARE TUNNEL . . .
continued

more water was hit not long after in the west heading near the base of Shaft 2. Grouting was required at least a dozen times in a fairly short stretch. And at one point the flow was so severe that a 40-ft concrete plug had to be built. It took two weeks to grout behind the plug and close the seams. Then the contractor drove through the plug and continued normal tunneling operations.

When a shaft was completed, headings were turned in each direction. For the first 200 ft, the base of each shaft was enlarged to accommodate double tracks, muck-dumping equipment, pumps, and similar devices. All drilling during the early development of the headings was done with Gardner-Denver air-leg drills operating from a simple rail-mounted platform. Muck was removed in battleship buckets.

Headframes

As soon as the headings were well established, the temporary shaft headframes were removed and replaced with permanent headframes. These huge structures weigh 190 tons, rise 150 ft, and are operated by Superior hoists powered by 250-hp electric motors. Hoists stationed on the ground run a skip-cage combination at a speed of 350 fpm. Riding in steel guides in the shaft, the combination consists of an 11-yd skip under a conventional cage. It requires a heavy counterweight.

To handle muck, a pit is excavated below the tunnel floor which accommodates the skip. Side-dump muck cars are tipped by a pneumatically powered arm and discharged into the skip. When loaded, the skip is hoisted up the shaft and into the headframe where it dumps automatically. Hoisting is slowed in the headframe so that guide rollers on the skip can engage a scroll-type guide that tips the skip. Muck is discharged into a hopper that loads truck with a hydraulically operated gate.

Although the hoist operator receives his signals by lights and bells, he has an indicator which shows the cage position at all times. The hefty 2-in. lines from cage and counterweight are each dead-ended on the huge drum. One winds as the other unwinds.

continued on page 196

You asked for

MORE FOOTAGE!
MORE SPEED!
LONGER BLADE LIFE!

You get them all in the new **FELKER**

di-lock

concrete cutting diamond blade!

Now you can get *greater economy, better overall performance* in new Felker Di-Lock Segmented Diamond Blades! Here's the fastest cutting, longest lasting diamond blade yet developed and it's cutting costs on concrete cutting jobs across the nation!

TOTALLY NEW, the Di-Lock is made by a completely different manufacturing technique. It grips its diamonds tighter than ever... holds them against severest shock and impact, keeps blades cutting for foot after foot after others give up!

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Model 257, 25 hp. Felker Concrete Cutter illustrated. Other models available from 7½ to 36 hp.

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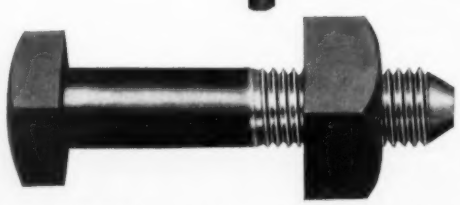
First in Diamond Cut-Off Blades!

Fasteners for the Big Jobs ...and for the Small

THREADED RODS. Bethlehem threaded rods can be furnished with cut threads or rolled threads. Cut-thread rods come plain or upset, in thread diameters up to and including 4½ in. Rolled-thread rods are made in thread diameters up to and including 1½ in. All lengths. Straight or bent. Single or multiple units. Black asphaltum coatings or hot-dip galvanized.

HIGH-STRENGTH BOLTS. Used with two hardened washers, to fasten structural members. Carbon steel. Quenched and tempered to meet requirements of ASTM Specification A-325. Also ideal for fastening bridge members, as the tight joints resist effects of vibration. Diameters from ½ in. to 1¼ in. Come in all popular lengths.

RIVETS. Two types: large and small. Full range of diameters and lengths. Come with button, high-button, cone, countersunk, round-top countersunk, pan and flat heads. Also swell neck.



FITTING-UP BOLTS. All styles and sizes. Low-carbon and high-carbon steel. Heat-treated. American National coarse threads or modified Acme threads.

If you are planning construction, on a large scale or small, you can count on Bethlehem supplying the fasteners to your complete satisfaction. Bethlehem produces a complete line of fasteners—every item you could possibly use in steel or timber construction. Whether you need the fasteners shown here, or something entirely different, we'll welcome the chance to work closely with you.

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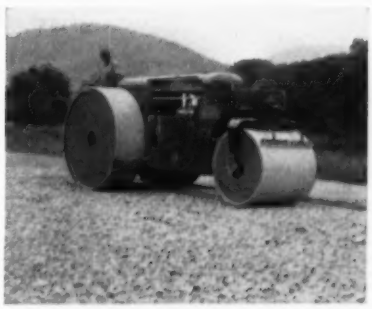
BETHLEHEM STEEL

Buffalo-Springfield 3-Wheel Roller on a widening and bituminous resurfacing job.

This 3-Wheel Buffalo-Springfield Roller is compacting earth fill for new pavement.

Buffalo-Springfield 3-Wheel Rollers speed compaction on fill consisting primarily of slate refuse from a coal mine.



Here a Buffalo-Springfield 3-Wheel Roller compacts crushed stone base for new highway.

To compact largest *variety* of material, use Buffalo-Springfield's 3-Wheel Roller

Buffalo-Springfield Heavy-Duty 3-Wheel Rollers are long-time favorites for handling the wide variety of materials found in fills, subgrades and bituminous pavements. Variable weights in 10-14 and 12-15 ton sizes, power roll brakes, tapered roller bearings on *all* rolls . . . assure widest range of use, unequaled safety, maximum maneuverability, smoothest performance and longest operating life.

The Buffalo-Springfield 3-Wheeler's time-proven 4-speed transmission is an unmatched assembly built for outstanding performance and durability under severe load conditions. Torque converter drive with 2-range transmission is also available as optional equipment.

When *one* roller must do *many* jobs, the Buffalo-Springfield 3-Wheel Roller is your best buy. Ask your nearest Buffalo-Springfield distributor today for all the reasons *why* Buffalo-Springfield 3-Wheel Rollers are top choice for multi-purpose compaction regardless of the type of material to be compacted.

Write today for a copy of the new 3-Wheel Roller Bulletin, S-72-156.

BUFFALO-SPRINGFIELD ROLLER CO.

DIVISION OF KOEHRING COMPANY · SPRINGFIELD, OHIO

Gets back on new slab sooner — speeds paving schedules

KOEHRING 16-E *twinbatch*® paver on rubber tires is as mobile as your batch trucks. It works on or off-pavement — can get back on new slab in as little as 7 days to pave adjoining highway strips, scattered intersections, approaches to driveways and side roads. This time-saving "run-about" makes self-powered moves at 9 m.p.h. Yet, for all its mobility, the Koehring 16-E *twinbatch* is primarily a production paver — exceeds the output of large single-drum pavers on main highway work. For instance —

On straight-production paving, the Koehring 16-E hits a top output of 86.7 batches an hour (based on 60-second mixing cycle). This *reserve* production capacity with *twinbatch* Autocycle mixing offsets normal job delays — lets you pick up lost time which cannot be made up with a limited production single-drum paver.

Averages 50 cu. yds. an hour

As a result, the Koehring 16-E *twinbatch* easily maintains an average of over 76 batches an hour — 8 hours a day. Based on 16 cu. ft. per batch, plus the usual 10% overload, this assures you 50 cu. yds. of concrete per hour — with a small crew — on your main-highway paving jobs.

While its usefulness is unlimited as a general-purpose paver, this versatile Koehring 16-E also serves as a mobile concrete mix plant. On construction of curbs, gutters, culverts, bridges, pilings, it discharges into overhead hoppers, forms, chutes, or loads trucks. Elevating boom reaches up and out 60° — gives controlled discharge at 21-foot height (higher with special boom).

See for yourself how the big production capacity, overall versatility, and rubber-tired mobility of this Koehring 16-E *twinbatch* can put you miles ahead on your paving schedules. Get all the facts from your Koehring distributor, or write us for 16-E catalog. Big 34-E *twinbatch* is also available for major highway, airport paving.

KOEHRING Company
Milwaukee 16, Wisconsin

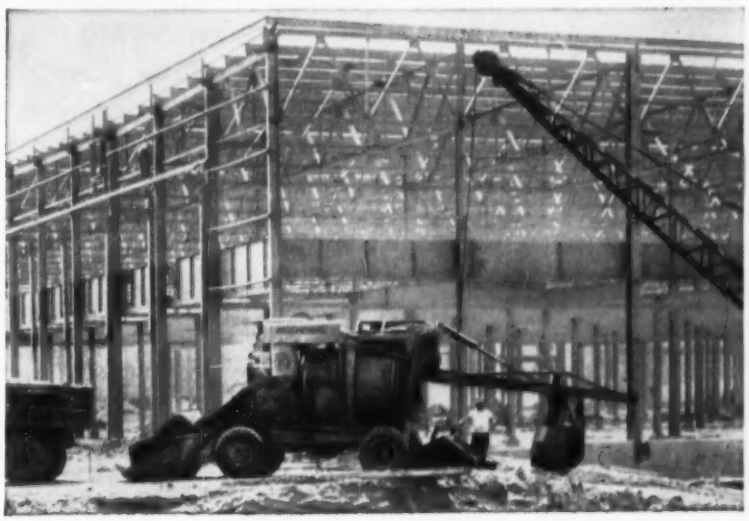
(Koehring Subsidiaries: **JOHNSON • PARSONS • KWIK-MIX)**

Big rubber-tires are easy on the sub-grade

Notice how there's little or no scuffing on the sub-grade with a Koehring rubber-tired 16-E paver. When working between forms, flotation of the big 11:00 x 20 pneumatic tires protects the grade against surface damage — saves unnecessary filling and re-leveling. This rubber-tired advantage also lets the Koehring 16-E *twinbatch* work on pavement without planking to pour adjoining slabs, widen highway and airport strips, pave intersections, pour concrete for curbs, gutters, culverts.

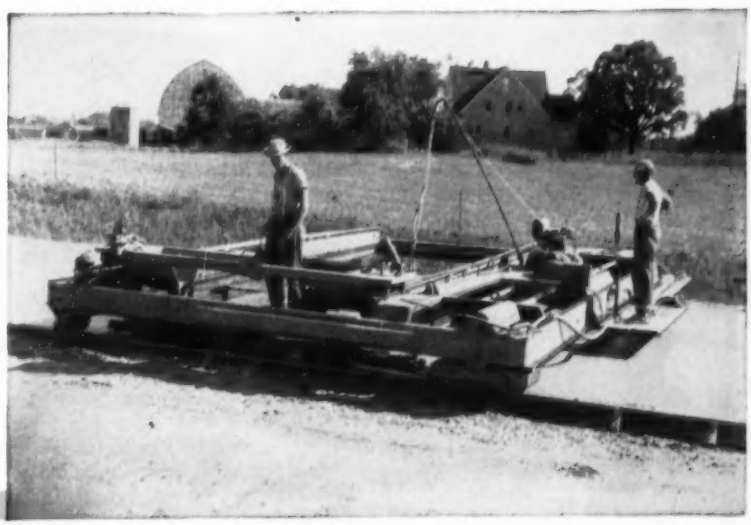
Mobile 16-E paver serves as a concrete mix plant

On building construction, versatile Koehring 16-E *twinbatch* pours footings, floors, columns — is never "grounded". Power-controlled boom swings in a 160° arc, or elevates 60° for overhead discharge — locks and holds in any position. Controlled-discharge bucket dumps anywhere along the 25-foot boom, can be opened or closed at any time for gradual discharge. Water-level capacity of bucket is 24 cu. ft. That's more than ample capacity to hold the full 16 cu. ft. batch of concrete, plus 10% overload.

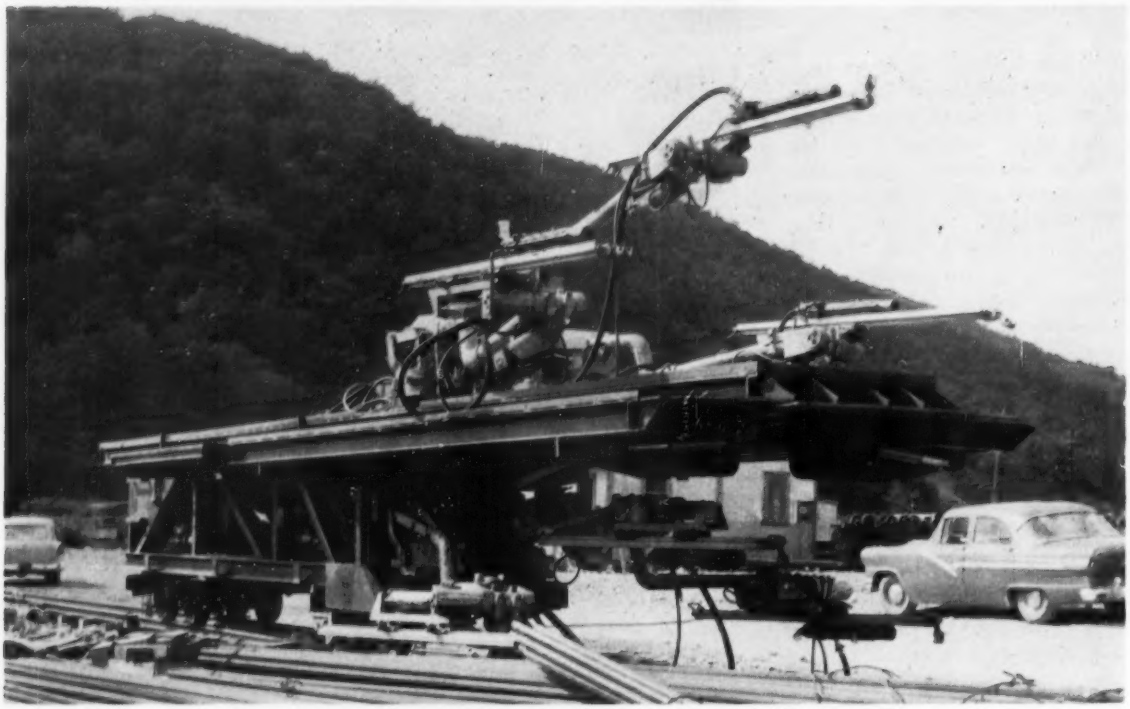


Precision finisher keeps up with any paver

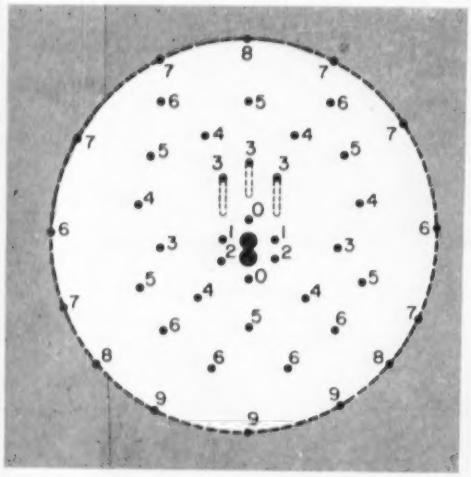
"Timely", precision-finishing is important on any paving job. Operating at almost twice the speed of a 34-E paver, Koehring Longitudinal Finisher handles all practical consistencies of concrete—harsh, wet or dry. It overcomes slump difficulties on grades and elevated curves. Produces mechanically accurate concrete slab surface, 8 to 30 feet wide, with uniform crown transitions.



Fully Hydraulic Jumbo is Driller's Delight



SIX DRIFTERS project from jumbo's front end, three from cantilevered platform and three underneath. Wings on side of jumbo are operated hydraulically. Stopers work from rear.



DOUBLE burn cuts made with 5½-in. drill pull more rock, concentrate muck pile.

SINGLE PANEL on each boom controls horizontal and vertical movement both of Gardner-Denver boom and drill. Two hydraulic motors on jumbo are air powered.

WEST DELAWARE TUNNEL . . .

continued

Drilling

As in any rock tunnel, the key operation is the repetitive drilling, shooting, and mucking at the headings. More than any other place, here is where efficiency counts—where seconds gained can add to vast savings by the end of the job. And it is here that the contractor has scored the highest.

His drill jumbo is perhaps the most modern ever employed in this type and size tunnel. Developed jointly with Gardner-Denver, it is 36 ft long, made of rugged steel construction, and rides the 30-in. gage track on two railroad trucks.

The jumbo is a driller's delight because just about everything is hydraulically operated. Six forward drifter drills on hydraulic booms each have four movements that can be controlled by a simple flick of the finger. Hydraulic booms move up and down and sidewise, and the drills also swing vertically and horizontally. Grouped controls on each boom permit the driller to spot each new hole quickly. That cuts set-up time, reduces fatigue.

Three drills are mounted on a top cantilevered platform; three

UNDERNEATH jumbo's cantilevered platform, miners quickly drill lower half of pattern. Holes are drilled 12 ft deep; shots pull more than 10 ft. Steel is changed only once.

ATOP jumbo's cantilevered platform, miners drill holes for upper half of pattern. Crucible drill steel is fitted with Vascoloy 1¾-in. carbide insert bits.

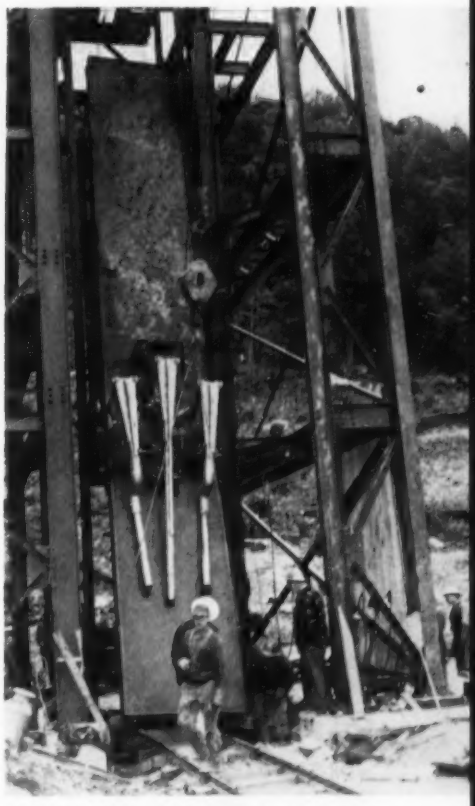
are mounted underneath on the jumbo frame. Hydraulic power also raises and lowers the heavy wings on the sides of the jumbo. Powering the entire system are two hydraulic pumps operated by an air motor.

Behind the three top drills is a large working area on which a second team of drillers operates three hand-held G-D stopers for driving Bethlehem and Republic roof bolts. For the 1-in. by 6-ft bolts, each hole is drilled with a 3-ft and then a 6-ft length of steel. Equipped with stop rotation and 36-in. telescopic legs, these stopers also drive the bolts. With a wedge set into its slotted end, each bolt is inserted into a steel strap and driven home. Straps bend easily to conform to the contour of the roof. Later, nuts are taken up by Chicago-Pneumatic impact wrenches to hold bolts securely.

Drilling of face holes and roof bolts is carried on simultaneously. Equipped with 1¾-in. Vascoloy carbide-insert bits and Crucible drill steel, the six drifters drill 12-ft holes with one steel change.

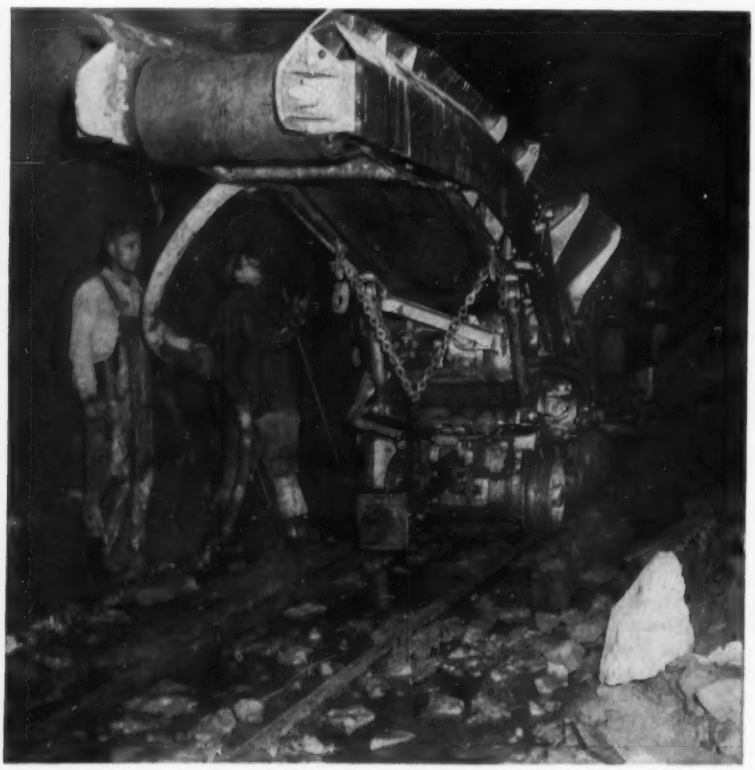
"Burn" Cut Pattern

Although the contractor has had considerable success with a conventional 50-hole pattern with a pyramid cut, he is not satisfied. In fact, at three headings he already has made a radical departure in drilling technique. He replaced the middle drill of the lower group of three with a 5½-in. drill from the Air-Trac, Gardner-Denver's hefty crawler drill. Instead of a pyramid cut, he drives two 5½-in. "burn" cuts, one on top of the other at the center of the face. These cuts provide a hollow core toward which the rest of the 46-hole pattern shoots. The results so far have not shown a spectacular improvement over conventional methods, but they do indicate that the "burn" cut probably can be developed into a highly efficient technique. It has numerous advantages. Only holes perpendicular to the face are required; and



LONG JUMBO partially dismantled is raised into headframe before lowering down shaft.

STOPER bucks against rear platform of jumbo to drill 6-ft hole in tunnel roof in which bolt will be anchored. Stopers and drifters are operated simultaneously.



MUCKING CREW awaits return of cars. Air-powered Eimco 40H mucker loads cars from conveyor belt. Canton passer handles car switching. It takes 20 cars per round.

it takes less powder, reduces overbreak, concentrates the muck pile, and pulls more rock. Reducing overbreak is especially important on the job because excavation is on a liner-ft basis instead of the conventional cu-yd unit.

Primary disadvantage of the big drill is maintenance. It limits flexibility at the heading because everything depends on the one unit. Mounting it on a standard boom has presented problems, but they probably could be overcome by fixing the drill in a rack hung from the cantilevered platform.

At any rate, the tunnel industry awaits further testing on the job before it goes all-out for the king-size drifter and the "burn" cut pattern.

Holes are loaded with DuPont or Hercules 47% strength dynamite and fired from a 440-v line. Dynamite is consumed at the rate of about 35 lb per linear ft of tunnel.

When dust and fumes are removed, muck is excavated by an Eimco 40H rig which loads cars with its conveyor. Muck-car handling is accomplished with a Canton car passer, kept about 100 ft behind the heading.

Here's how it works: A Plymouth 10-ton diesel locomotive, with Fuller torque converter, returns to the heading after each shot pushing one empty car and pulling a train of about five cars. When the train passes the car passer, the rear empty is uncoupled and pushed onto the passer. Meanwhile, the front empty is pushed to the mucker.When loaded, it is pulled back by the train beyond the passer, the empty is returned to the track and pushed to the mucker, and the operation is repeated until the entire train is loaded. It takes about 20 cars to remove each round.

Plant and Utilities

Each heading carries forward a variety of vital utilities. Electricity is transmitted in a 2,300-v line with a transformer every 1,000 ft for stepping it down to 440 v.

All pipelines are Naylor spiral weld. Compressed air is carried in a 6-in. pipe, water in a 4-in. pipe, pump discharge water in a 6-in. pipe, and ventilating air in a 26-in. pipe hung from the roof.

Compressed air at each shaft is developed by four Gardner-Denver double compressors, two for each heading. Direct connected to

continued on page 202

Big Dig! 2,776,000 cubic yards of earth and rock had to be excavated by J. Robert Bazley, Inc., for the Scranton-Allentown sections of the Pennsylvania Turnpike.

J. Robert Bazley, Inc., Pottsville, Pa.

uses ESSO MULTI-PURPOSE GREASE H ...cuts lubricating costs, prevents errors

J. Robert Bazley, Inc., of Pottsville, Pa., recently completed 9.78 miles of the Pennsylvania Turnpike's new Northeast Extension. Preparation work on one section involved the heaviest excavation on the entire extension. (One cut was 1000' long and required moving 697,000 cubic yards!)

Bazley uses Esso Multi-Purpose Grease H in *all* equipment — for chassis, wheel bearing and general lubrication. Its performance has been truly outstanding . . . equalling or excelling the performance of several special-purpose greases. And Multi-Purpose Grease H has meant considerable savings, too. For one thing, there is no need of stocking a variety of greases. This means simplified inventory — resulting in faster dispensing. But even more important, there is never any chance of using the wrong lubricant and causing damage that could result in costly repairs and down-time.

Bazley now operates over 500 pieces of major power equipment. They *all* run on Esso fuels and lubricants *exclusively*. In fact, for almost *20 years*, Bazley has depended upon Esso products for the finest engine performance...maximum power, fewer breakdowns, longer life. They've never been disappointed!

For better results.

ESSO

PETROLEUM PRODUCTS

Esso products and services are available through Esso Standard Oil Company plants and offices in more than 400 cities and towns throughout New England, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, the Carolinas, Tennessee, Arkansas, Louisiana and the District of Columbia.

The Big Fleets buy

Ford's Tandem Models go modern in a big way! GVW's up to 45,000 lb., GCW's up to 65,000 lb. Wide choice of engines and chassis components permit you to meet your type of hauling conditions.

Why?... Because on-the-job performance and low operating costs prove FORD trucks cost less

Billions of miles of on-the-job experience have proven Ford's dependable performance and low operating costs to the big fleet owners.

Contractors and suppliers, engaged in heavy construction work, have found Ford trucks are best for their fleets, too. To begin with, Ford's initial costs are low. Many models are priced below all competitive makes. For example, the new Ford Tilt Cab models are America's lowest-priced!*

And it costs less to run a Ford truck. Thanks to modern Short Stroke power and sturdy chassis construction, operating costs and "shop time" are reduced. Another important Ford plus is longer truck life—a fact certified by independent insurance experts.

Add it all up—you'll find Ford trucks do cost less! Contact your Ford Dealer . . . let him show you why the big fleets are buying more Ford trucks than any other make.

*Based on comparison of manufacturers' suggested retail delivered prices

FORD TRUCKS COST LESS

LESS TO OWN — LESS TO RUN — LAST LONGER, TOO!

more FORD TRUCKS than any other make!

Ford's Big Jobs are heavy-duty throughout. New, more durable engines. New stronger cabs and chassis. Up to 45,000 lb. GVW, GCW's up to 60,000 lb.

Representative companies in the Construction Industry that have picked Ford trucks for their fleets...

McDOUGAL-HARTMANN CONSTRUCTION CO.
Peoria, Illinois

EDWARD H. MEYER CONSTRUCTION CO.
Neenah, Wisconsin

M. HOEFFKEN COMPANY
Belleville, Illinois

D. B. THORNTON, INCORPORATED
Atlanta, Georgia

S & W CONSTRUCTION COMPANY
Memphis, Tennessee

KAFFIE LUMBER & BULK BARITES, INC.
Corpus Christi, Texas

MYERS & QUIGG INCORPORATED
Washington, D. C.

LATEX CONSTRUCTION CO. OF GEORGIA
Atlanta, Georgia

PARK CONSTRUCTION COMPANY
Minneapolis, Minnesota

J. H. DURRANCE COMPANY
Fort Lauderdale, Florida

BROWN & ROOT, INC.
Houston, Texas

BUILDERS MATERIAL, INC.
Cedar Rapids, Iowa

TEXAS BITULITHIC COMPANY
Dallas, Texas

J. H. POMEROY & CO., INC.
San Francisco, California

WESTERN CONCRETE
Los Angeles, California

B. O. WILLIAMS CONSTRUCTION CO.
Richmond, Virginia

IMPERIAL PAVING COMPANY
Oklahoma City, Oklahoma

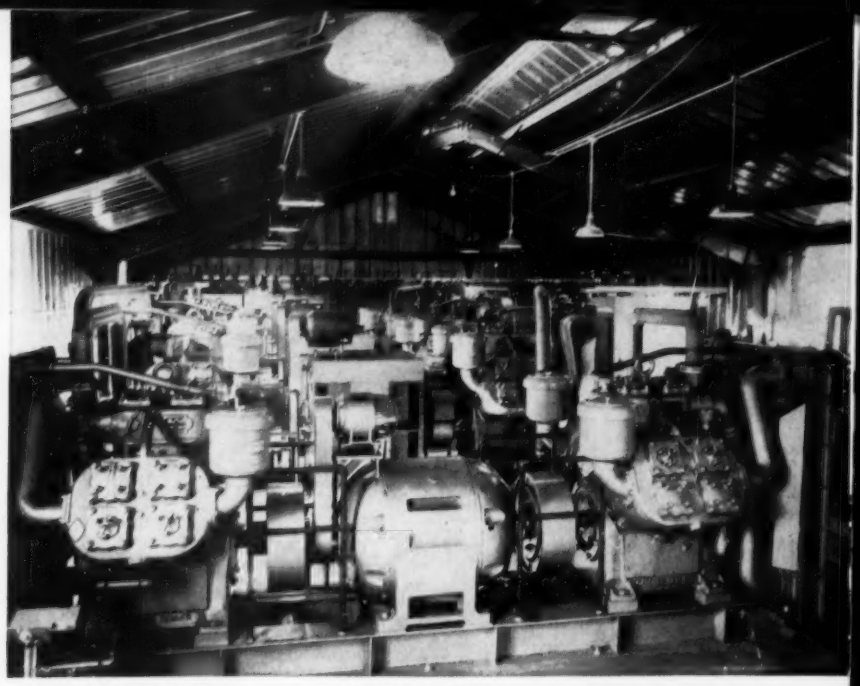
UNION BUILDING & CONSTRUCTION CORP.
Passaic, New Jersey

BAYER & MINGOLLA
Worcester, Massachusetts

MORRISON-KNUDSEN COMPANY, INC.
Boise, Idaho

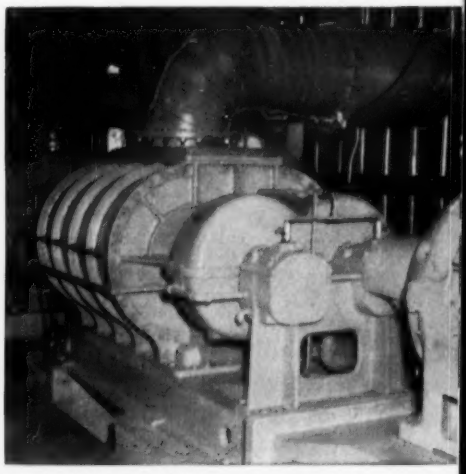
DEL E. WEBB CONSTRUCTION CO.
Phoenix, Arizona; Los Angeles, Calif.

Good Housekeeping Keeps Plants And Utilities Sparkling



NEAT PACKAGE UNITS consist of Gardner-Denver double compressors powered by 250-hp General Electric motors. They combine radiator and intercooler, supply 1,150 cfm.

STEEL BUILDING at Shaft 1 houses compressors and blowers. Machinery is kept as neat as a pin. Burgess-Manning snubbers outside building muffle blower noise.



REVERSIBLE BLOWERS supply 15,000 cfm of ventilating air to each heading.

a 250-hp electric motor, each double compressor is a package unit. With a capacity of 1,150 cfm. They are compact and easy to set up.

Ventilation equipment is housed in the same neat plants that house the compressors. At each shaft, two Roots-Connersville rotary blowers supply 15,000 cfm of air to each heading. Powered by 250-hp electric motors, they reverse for exhausting dust and fumes. Noise is muffled with Burgess-Manning snubbers.

Water at the headings is picked up by sump pumps, piped to the shaft, and raised to the surface by two Ingersoll-Rand 500-gpm electric pumps.

Personnel

Representing the joint-venture firm of Drake-Grafe-Winston-Tecon-Conduit are Clancey O'Dell, project manager, John Hester, general superintendent, Jack Fanning, equipment superintendent, Richard King, project engineer, Gail Knight, assistant project engineer, and R. Leffey, office mgr. Walter Keane is superintendent at Shaft 1, "Red" Gatrell at Shaft 2, Joe Walker at Shaft 3, and "Sparky" Mathis at the portal.

Deputy chief engineer N. Leroy Hammond is in charge for the New York City Board of Water Supply, whose chief engineer is Stanley M. Dore.

MUCK TRAIN is pushed to heading by 10-ton Plymouth diesel locomotive with torque converter.

THE RIGHT POINT SHAPE

will INCREASE your PROFITS!

PUT MORE PROFIT IN EVERY PASS—select the *right* point shape for your particular digging condition. There's an *ESCO* point shape to give maximum digging efficiency in *any* kind of work. You choose from seven shapes—six different sizes. No other point manufacturer offers such a complete selection.

Use the *right ESCO* point shape for your job—on your dragline, dipper, hoe dipper, clamshell, front loader, ripper or dredge. Try several shapes—see which gives you the best results. Your *ESCO* dealer has them all in stock. He'll be happy to give you details.

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Portland Manufacturing Plant

Other Offices and Warehouses
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Centralia, Pa.
Houston, Texas
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Salt Lake City, Utah
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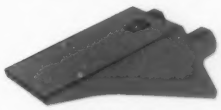
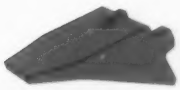
ESCO

OFFERS YOU A POINT SHAPE FOR EVERY DIGGING CONDITION

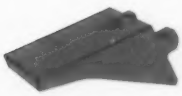


GENERAL PURPOSE

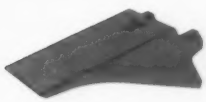
SHARP



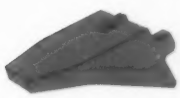
PICK



ROCK



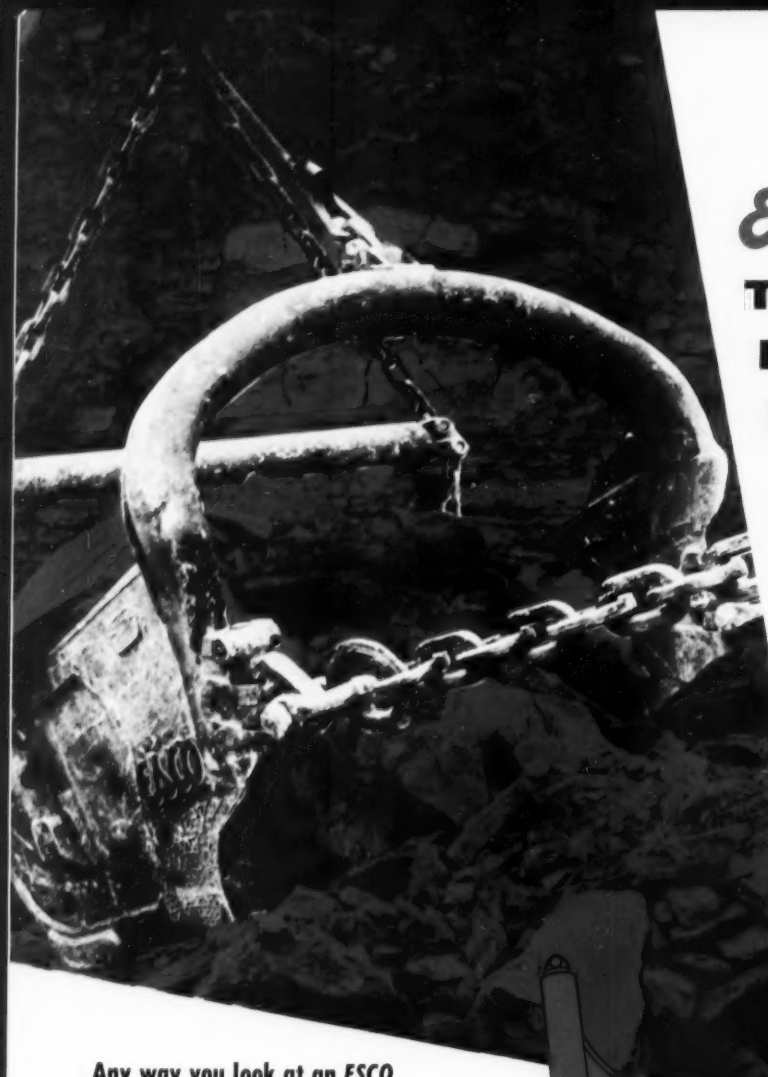
SHARP LONG



PICK ROCK

SHARP FLARED

You get more dig for your money with ESCO Tested Points because they sharpen as they work.



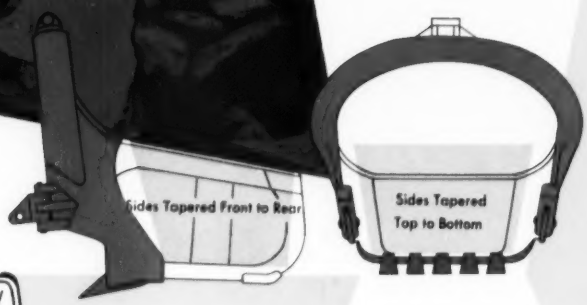
ESCO

TAPERED DRAGLINE BUCKETS

LOAD FASTER DUMP CLEANER

Any way you look at an *ESCO* Tapered Dragline Bucket it's the taper that makes it better.

PATENTS PENDING



LOAD FASTER. Bucket sides flare outward from the lip to increase loading speed. Material is not compressed into the opening but allowed to expand and flow up and back along the tapered sides, filling the bucket completely without voids in the rear. Bucket fills in shorter drag distance – less line pull required.

DUMP CLEANER. Taper from front to rear and outward flare from lip to arch allows load to drop quickly and easily from the bucket. Load always dumps clear of high tubular arch.

LAST LONGER. Tapered design reduces loading and dumping friction to an absolute minimum. Bucket lasts longer. All welded construction and the maximum use of alloy steel castings make a high strength-to-weight ratio possible, resulting in "lower cost per yard operation".

ESCO Tapered Dragline Buckets have proved their ability to load faster, dump faster and cleaner by thousands of hours of operation in all kinds of digging. Currently available with lip widths from 52" to 96", 2½ to 15-yd. sizes. Ask your nearest *ESCO* dealer for details today, or write direct.

Manufacturing Plants
2149 N. W. 25th Ave., Portland 10, Ore.
1017 Griggs Street, Danville, Illinois

ESCO International New York Office
at 420 Lexington Ave., New York City, or Portland Manufacturing Plant

Other Offices and Warehouses:
Los Angeles,
San Francisco, California
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ESCO®

ELECTRIC STEEL FOUNDRY CO

Portable A-W plant producing base material for large state highway job near Los Banos, California.

AUSTIN-WESTERN Crushing Plant produces rock at low cost for Richards-Underdown Co., Fresno, Cal.

High output and low cost—that's the story on the Austin-Western 101-S Crushing Plant working for one of the biggest producers in the San Joaquin Valley. Despite its large capacity, it can be moved easily and fast from job to job.

In the operation shown above, feed material is scalped ahead of the crushing plant to remove fines and produce minus 1¼ inch material. Feed over the scalper goes to the primary crusher, which has a 1036 jaw. It then passes into the big 30 x 20 inch roll crusher, which turns out a ¾ inch plant-mix material. The plant has three conveyors, which deliver sand and road-base material in sizes of 1 inch and minus ¾ inch.

The plant is powered by a 62.5 kva generator, driven by a diesel engine. The individual motors operate the conveyors and the scalping screen through short-coupled V-belts—there are no idlers, clutches, etc., to cause mechanical loss. The crushing plant itself is direct-diesel-driven by a propeller shaft. A single convenient push button station controls the entire closed-circuit system.

There's a high-speed, profit-making Austin-Western Plant exactly right for your needs. Call on your nearest distributor for full information. Or write Construction Equipment Division, Baldwin-Lima-Hamilton Corp., Lima, Ohio.

COMPARE—AND YOU'LL WANT AN AUSTIN WESTERN CRUSHING PLANT

1. *Welded steel plate frame for high strength without weight of cast steel frame.*
2. *Machined steel toggle plate for absolute protection, instead of cast iron.*
3. *Inclined positive-throw-type vibrating screen.*
4. *All moving screen parts operate in rubber bushings that need no lubrication.*
5. *Dual rear wheels for added stability; fully enclosed brakes on rear tandem.*
6. *Oversize self-aligning spherical bearings in crusher.*
7. *Heat treated chrome vanadium steel shaft in crusher.*

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

AUSTIN-WESTERN
CRUSHING, SCREENING AND WASHING EQUIPMENT

BALDWIN BLH LIMA-HAMILTON

BALDWIN-LIMA-HAMILTON
Construction Equipment Division — LIMA WORKS

OTHER DIVISIONS: Austin-Western • Eddystone • Electronics & Instrumentation
Hamilton • Loewy-Hydropress • Madsen • Pelton • Standard Steel Works

Aluminum dump bodies add two tons a trip, $6,240 a year profit

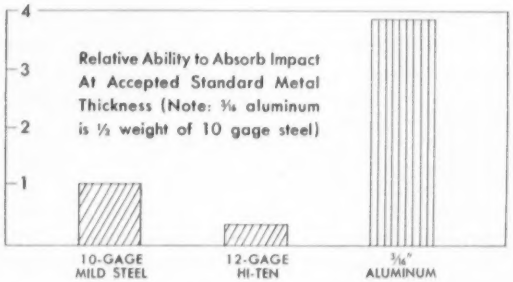
Every extra ton of uranium ore is extra insurance for America's future security and growth. G & C Truck Lines, of Riverton, Wyoming, is able to haul two more tons of ore every trip, thanks to weight-saving aluminum.

Extra payload means extra profit. The truck operator is paid 7¢ per ton-mile. Figuring two trips a day, five days a week, 52 weeks a year, the extra ore hauled earns an additional $6,240 a year. This pays for the small premium for aluminum in 3½ months. After that, it's pure gravy!

The uranium ore is hauled 86 miles. Forty-six miles are over unimproved dirt roads that are washboard rough. For this tough service, G & C also chose round, balanced, true-running Alcoa® Aluminum Forged Disc Wheels.

Williamsen Body and Equipment Company builds aluminum dump bodies for trucks and trailers. Designed with Alcoa Aluminum alloy these bodies have three times the impact resistance of steel at half the weight.

Other manufacturers also build dump bodies of Alcoa Aluminum to make hauling more profitable for you. Get their names and FREE Dump Body folder by writing today to Aluminum Company of America, 1879-E Alcoa Building, Pittsburgh 19, Pennsylvania.



Your Guide to the Best in Aluminum Value

ALCOA ALUMINUM

ALUMINUM COMPANY OF AMERICA

MEMBER TRUCK-TRAILER MANUFACTURERS ASSN. TTMA

THE ALCOA HOUR
TELEVISION'S FINEST LIVE DRAMA
ALTERNATE SUNDAY EVENINGS

Air From Crane Opens Bucket

WORKER pulls ropes to actuate valve that allows compressed air to open discharge gates and start vibrator on side of bucket. Rubber elephant trunk is permanently attached.

CONCRETE BUCKET HANDLING has reached a new high in safety and efficiency at the Perini Corp.'s Barnhart Powerhouse job on the St. Lawrence.

Instead of a worker stabbing an air hose into a swaying bucket then turning a valve to open the gates, he simply pulls on a rope and the bucket does the rest. The key is in the air supply; it comes right from the crane cab. A 32-cfm electrically powered compressor sends air up the boom through a ¾-in. pipe. Near the end of the boom the pipe connects to a ¾-in. rubber hose that carries air directly to the rams that open the gates on the bucket.

Naturally, the hose can not run straight from boom to bucket. It must have adjustable length so that it can always be held taut regardless of the position of the bucket. To do this, the contractor runs the hose from the end of the ¾-in. pipe, back under the boom, around a small movable sheave, back up the boom, around a fixed sheave, and then down to the bucket.

The lower movable sheave mounts a small pulley on top which allows the sheave to ride a cable hung under the boom. This sheave is continually pulled by a Rud-o-Matic tagline that keeps the entire hose system tight. Whether the bucket is close to the tip of the boom or 150 ft away, the air-hose rigging hangs tight under the boom, eliminating any dangers of entanglement.

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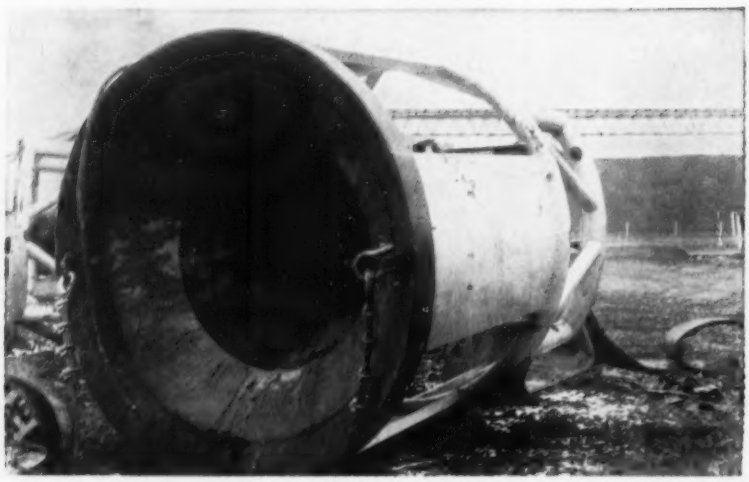
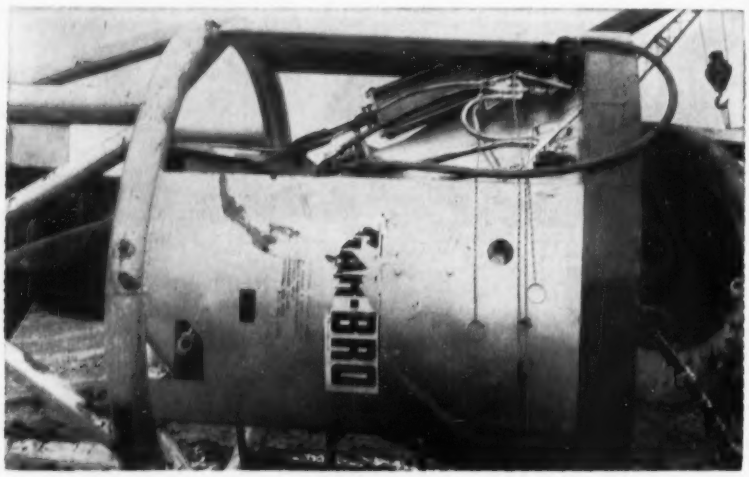
AIR LINE begins in crane cab, runs up boom, back down and around traveling pulley, up to and around fixed pulley, and to bucket.



CONE-SHAPED RIM overlaps cavity of unique bucket to prevent spillage when quick-dumping Dumptors mounted on trucks discharge concrete into bucket. Bucket holds 4 yd.



SPRING-LOADED VALVES with pull-chains operate gates and vibrator. Air reservoir on side of bucket closes gate when main valve is closed. Big spring aids closing.

COLLAPSED rubber elephant trunk is snaked into narrow confines of intricate wall pour.

Special Bucket

The bucket itself is of special design worked out jointly by Perini Corp. and the Gar-Bro Co. Two lines dangle from the bucket. When one is pulled, a valve sends air to the ram that opens the gates. When the rope is released, the spring-loaded valve closes, and air stored in a small tank on the bucket provides enough push to close the gates. In case the force from the tank is not adequate, springs on the gates provide enough extra pull.

If the mix is stiff, there is sometimes difficulty unloading the bucket. In this case, a second line is pulled to actuate a 2-in. external air vibrator mounted on the side of the bucket. When the line is released, a spring loaded valve cuts off the air to the vibrator.

If anything goes wrong with the automatic mechanism, an air hose fitting is built into the bucket for conventional dumping.

Normally, the huge number of intricate wall pours would slow concrete placing. But Perini has designed a system which makes the toughest pours seem simple. Because most of the concrete must be placed in restricted areas, he permanently attaches 20-in. dia elephant trunks to his buckets. The trunks, made of strong rubber, hang collapsed when empty to permit easy bending and also to prevent segregation when the concrete falls through.

This permanently attached elephant trunk is possible only because the bucket never has to be switched. When empty, the bucket is swung into the loading dock in such a way that the trunk is first laid on the ground, then the bucket is placed against the dock and loaded by truck-mounting Dumptor bodies.

Buckets are built on top of a pipe frame to allow the elephant trunk to remain attached at the bottom when the bucket is set down for loading. To keep their center of gravity low, buckets are made considerably wider than conventional 4-yd units.

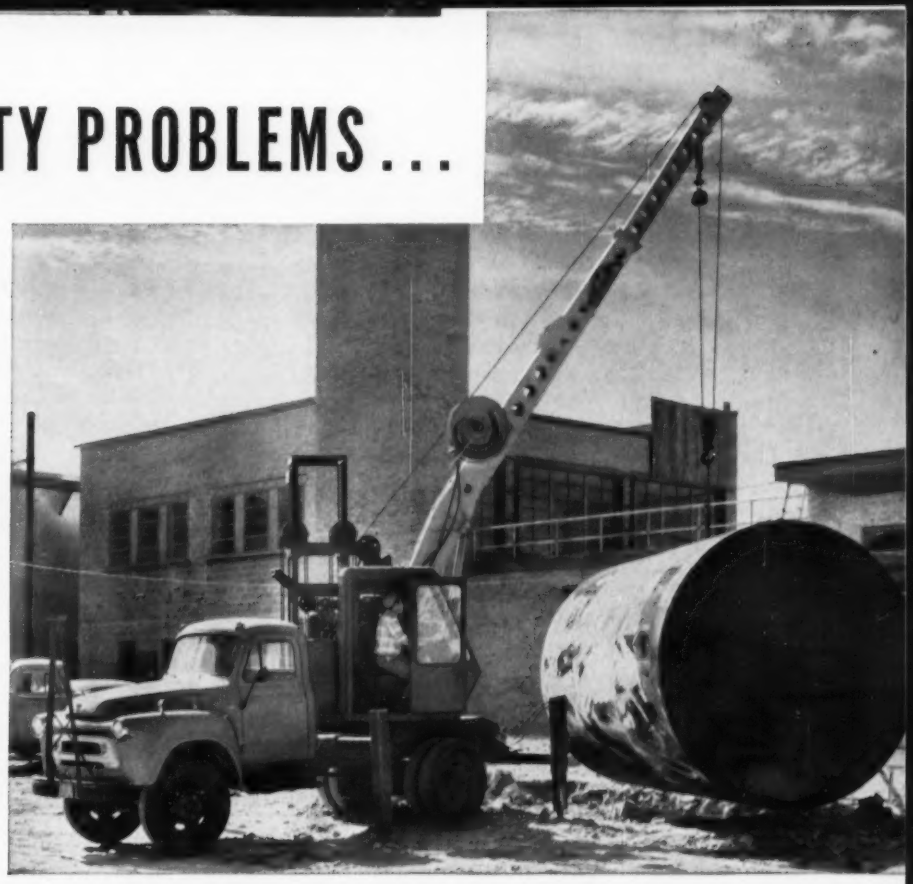
Personnel

Credit for designing and developing the unique concrete placing system goes to Albert Berry, project manager, and Vic Pandolfi, equipment superintendent.

LOOK! TWENTY PROBLEMS...

BUCYRUS ERIE

H-3 Hydrocrane Can Solve Them All



PROBLEM.....	HYDROCRANE'S SOLUTION
1. Travel time between jobs	Up to 50 mph travel speeds
2. Reach into building, boxcar or semi	Telescoping boom
3. Weigh loads	Load indicator
4. Set up frequently	Hydraulic outriggers that set in seconds
5. Work in close quarters	Shortest tail swing in its class
6. Handle fragile loads	Precision hydraulic control
7. Change boom angle often	Working boom hoist
8. Make high lifts	Boom lengths to 38' (plus 10-ft. or 18-ft. jibs)
9. Lift heavy loads	New 5-ton capacity
10. Inexperienced operators	Easy-to-learn hydraulic operation
11. Dig trench *and* lay pipe	Quick and easy conversion from Hydrocrane to Hydrohoe
12. Excavate short, deep pits	Clamshell or wrist-action utilities Hydrohoe dipper
13. Eliminate hand trimming	Telescoping digging action combined with wrist action

PROBLEM.....	HYDROCRANE'S SOLUTION
14. Minimize danger of damage to underground pipe, conduit, etc.	Precision hydraulic control
15. Stockpile or load light materials	One-yd. trash bucket or ½-yd. material handling bucket
16. Work on rough, irregular ground	Hydraulic outriggers quickly level machine
17. Travel over lawns, low capacity bridges	Hydrocrane on conventional truck is extremely light
18. Reduce "down" time	Simple design cuts costly maintenance
19. Cut move-up time	Remote control of truck engine (optional equip.)
20. Hoist loads rapidly	New selector valve greatly increases line speed

BUCYRUS-ERIE COMPANY

South Milwaukee, Wisconsin

Yes, the H-3 Hydrocrane is the only ⅜-yd. crane-excavator that does so many jobs so well. Mounted on a new or low-cost used truck, the 5-ton H-3 Hydrocrane is the digging and lifting package that returns more per dollar invested than any other machine in its class. Your Bucyrus-Erie distributor will be pleased to tell you all about the H-3 — and about the larger, 10-ton capacity H-5.

171H57C

Owners know that every Allis-Chalmers engine is backed by the company's long reputation for building engines that are *tops* in dependability and economy — engines totaling hundreds of thousands of horsepower.

Operators like the continuous-duty rugged power, the reserve built into their Allis-Chalmers engines. As loads increase, these high-torque engines lug right through.

They ALL Like Allis-Chalmers Engines...

Mechanics find there are less parts — that they are simple, easily accessible, require fewer adjustments. Maintenance time is reduced to a minimum.

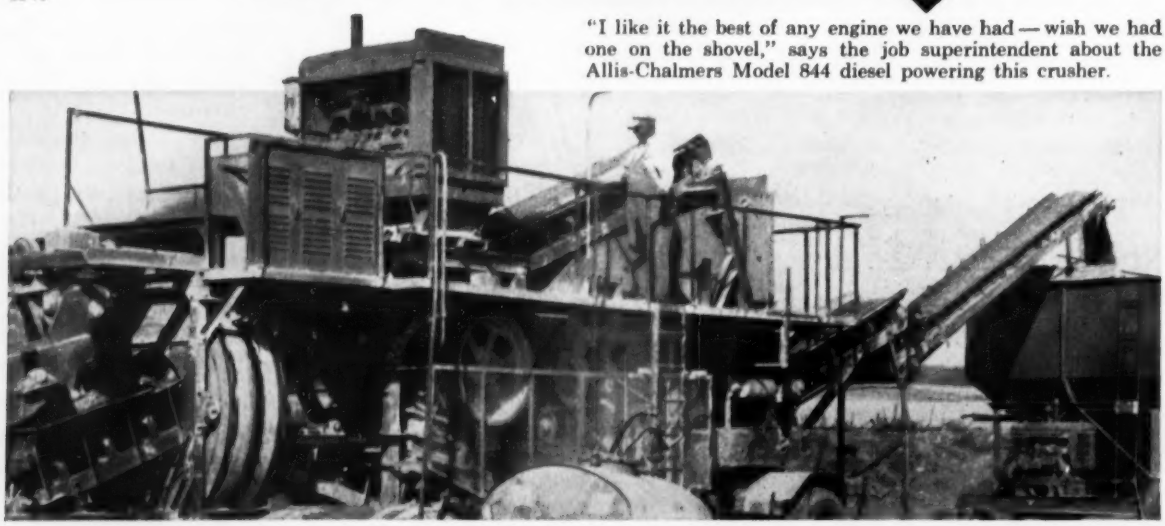
Everyone likes the Allis-Chalmers *3-deep* service from the dealers, the 18 branches and the factories.

For more reasons why "they all like Allis-Chalmers engines," see your Allis-Chalmers engine dealer, or write for detailed information.

ALLIS-CHALMERS, BUDA DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

BE-10



"I like it the best of any engine we have had — wish we had one on the shovel," says the job superintendent about the Allis-Chalmers Model 844 diesel powering this crusher.

Cofferdam enclosing 35 acres of water makes possible...

Excavating a Lake in the Dry

By CARL F. INGWALSON
Estimator-Engineer, Contracting Division
Dravo Corp., Pittsburgh

IT TOOK nearly a mile of cofferdamming to enclose the area, but the cofferdam saved us money in the long run.

Dravo Corp. has the job of building Taconite Harbor, a big iron ore port on Lake Superior 75 miles northeast of Duluth, Minn. Part of the job was to excavate about 800,000 cu yd of solid rock from a 35-acre area of the lake in water up to 30 ft deep.

The obvious method would seem to be underwater drilling, blasting, and excavating. But we have had years of experience with cellular steel sheet pile cofferdam construction for river locks, dams, and bridge substructures. We believed this type cofferdam would prove to be more economical—and it did.

Enclosing the area with a cofferdam permitted drilling, blasting, and excavating operations in the dry. It also provided some large size rock that could be used for armoring the 4,000 ft of breakwater. If we had dredged up this rock, we would have had to break it into sizes too small for this use.

Working in the dry also gave us better control over excavation depth, and we had no serious complications from over-shooting or digging. In addition, winter weather and rough water did not stop operations; excavation continued throughout the winter without interruption.

The cofferdam also served double duty. Some cofferdamming would have been required in any case to construct the dock face, which consists of a concrete wall dowelled to the rock at the elevation of the harbor bottom.

The cofferdam presented some interesting design and construction problems. With 250 miles clear

For Low Cost Bituminous Paving from Superhighways to Driveways . . .

Get all the advantages of Blaw-Knox Bituminous Paving Equipment

For any type of bituminous paving operation, the efficient production of Blaw-Knox bituminous paving equipment will keep operating costs at a minimum. Where big yardages are involved for superhighways, airports or turnpikes the combination of Blaw-Knox PF-90 Bituminous Paver Finisher laying asphaltic concrete on base course material laid by a Blaw-Knox Base Paver will assure big profitable production. Where the jobs are smaller and working area confined such as driveways, parking lots, alleys, play areas, or streets, the Blaw-Knox PF-45 Black Top Paver will give you the kind of production that will mean money in the pocket. When shoulder paving or road widening are involved the Blaw-Knox Road Widener and Trench Roller team will reduce hand labor, wasted material, form setting and rolling time.

All units in the line of Bituminous paving equipment are engineered to give maximum versatility. They can be adjusted to work in various widths and handle many types of material or mixes. For complete information see your nearest Blaw-Knox distributor.

Road Widener can be used to spread gravel or pave concrete and asphalt on shoulder paving or road widening jobs. They can be adjusted to work from 18″ to 10′.

Trench Roller speeds trench compaction in either narrow or wide trenches. Rolling width and depth can be adjusted while roller is in motion.

Model PF-90 Bituminous Paver Finisher has high capacity features for big job production. No other paver offers its combination of rubber-tired mounting, paving speed, paving width, capacity and high travel speed — features that mean more tons per shift on day-after-day jobs.

Model P-150 Base Paver spreads big tonnages of base course material without segregation. Its oscillating screed knits fine or coarse material into an even compact base course that is true to grade and crown.

Model PF-45 Black Top Paver assures big profits on small to medium black top paving jobs. Its rubber-tired mounting, capacity, high travel speed and maneuverability save time and hand labor when working in confined areas or on scattered jobs.

For complete information of the complete line of Blaw-Knox bituminous equipment send for the following bulletins — for the Model PF-90 Bituminous Paver Finisher, No. 2475; for the Model P-150 Base Paver, No. 2457R; for the Model PF-45 Black Top Paver, No. 2539; for the Road Widener, No. 2458R and for the Trench Roller, No. 2497.

BLAW-KNOX

BLAW-KNOX COMPANY

Construction Equipment Division

38 Charleston Ave., Mattoon, Illinois

EXCAVATING A LAKE . . .

continued from page 211

"fetch" on the lake all the way from the northeast, it is possible for 18-ft waves to build up at the construction site. After studying storm conditions, we selected a design for a maximum wave of about 10 ft that would break up to about 15 ft when it hit the cofferdam.

We figured hydrostatic pressures and decided on a maximum size cell of 49-ft dia with interlock tensions of up to 2,000 lb per lin in. We connected individual cells with arcs and 30-deg Y-piles. The cofferdam consisted of 81 cells. It was built in two stages so that rock excavation would start in the first half while the second stage was under construction.

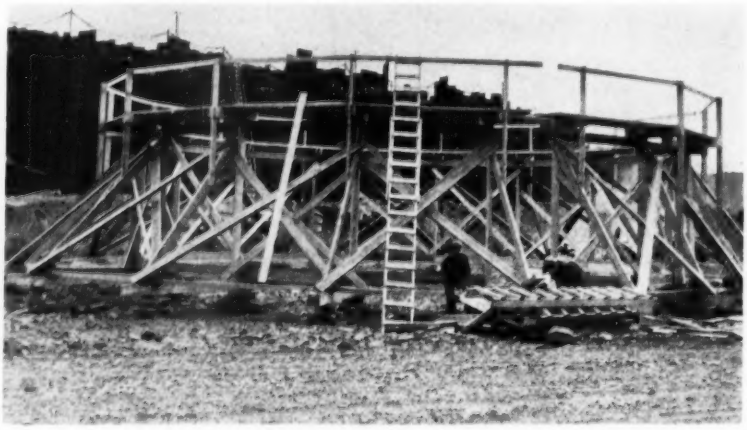
Rough and Rocky

One look at the rugged, rocky shore indicated that the bottom of the lake would be bad. We expected the lake bottom to be bare rock, so we planned to place a sand and gravel blanket 10 ft thick to provide a toe for the sheet pile of the cofferdam cells and help seal against leakage.

Because we had to expose all rock above 30 ft below water, we began by locating the minus 30 contour on the rock. This became the general inside perimeter line of the cofferdam.

A derrick boat with clamshell bucket dug a few exploratory holes in the lake bed to establish the general rock depth. This exploration work revealed that there was more sand and gravel on the bottom than

SHOVEL working behind cofferdam loads blasted rock from lake bottom into 22-ton Euclid trucks. Underwater work during the severe winter would have been difficult or impossible.



TEMPLET for cells in an auxiliary arm that is constructed in the dry is similar to the templet for cells driven in open water but is made up of much lighter timbers.

FLOATING PILE DRIVER places the connecting arc between two cells at the outer rim of the cofferdam. Templet in end cell has no cross bracing in its bottom ring so that the cone of the fill can be brought above that elevation before templet is removed.

INSLEY type WB

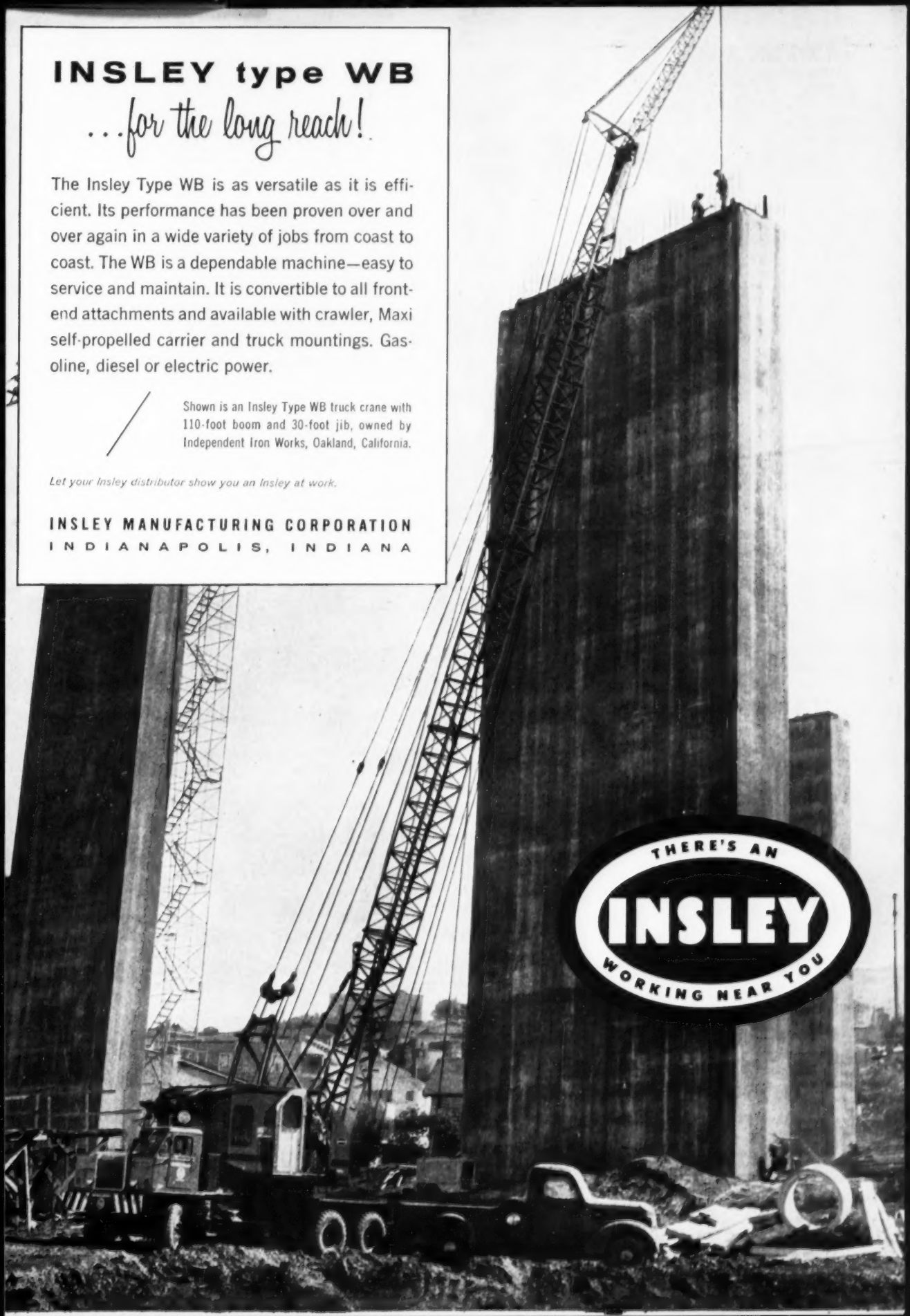
...for the long reach!

The Insley Type WB is as versatile as it is efficient. Its performance has been proven over and over again in a wide variety of jobs from coast to coast. The WB is a dependable machine—easy to service and maintain. It is convertible to all front-end attachments and available with crawler, Maxi self-propelled carrier and truck mountings. Gasoline, diesel or electric power.

Shown is an Insley Type WB truck crane with 110-foot boom and 30-foot jib, owned by Independent Iron Works, Oakland, California.

Let your Insley distributor show you an Insley at work.

INSLEY MANUFACTURING CORPORATION
INDIANAPOLIS, INDIANA



we had expected and that the rock bottom actually was even rougher than we had anticipated.

This predigging was continued just ahead of the cofferdam cells throughout the job. The material dredged was placed in barges and used for cell fill.

The predigging enabled us to locate the rock surface, establish cofferdam location, and determine the length of sheet pile required in each cell.

For a considerable portion of the first stage cofferdam, there was an abrupt submarine drop-off to the rock surface below the minus 30 contour. In one cell location the rock was only 23 ft below water on the inside of the cofferdam, but it was 58 ft under water on the lake side—a drop of 35 ft.

In this particular case, it was necessary to drill and load the 7 ft of high rock under the cell while the cofferdam was dry and wait until after the area was flooded again to shoot and excavate. When the charge was exploded, the water cushioned the blast so that there was only minor damage to the cell. The rock blasted free was removed by dredging.

We used ⅜-in. web, 16 in. wide standard steel sheet pile up to 75 ft long. All outside sheets were carried to rock to make a positive cut-off of infiltrating water and permit draining of cell fill. When it was necessary to place a sand and gravel blanket on the lake bottom before sheets were set and driven, material was excavated, loaded to barges, and dumped in the required locations.

A derrick boat set and drove the sheet pile around a double-ring wood templet that was held in place by four steel bearing-pile spuds. The bottom ring of the template contained no cross bracing so that the cone of the fill could be brought above this elevation before the template was raised.

Sudden storms with rough water were a constant problem. Generally, we tried to fill each cell immediately after setting and driving was completed. But one severe storm caught a crew with a cell partially set and not yet closed. The crew saved the cell by lashing the sheets to the templet.

Originally, we intended to haul most of the cell fill out from land with 22-ton Euclid trucks that would dump through a site-fabricated movable bridge. But because there was more sand and gravel on the lake bottom than we had expected, most of the fill was dredged from the lake, hauled to the site in scows, and placed in the cells by derrick bucket.

COMPLETED CELLS serve as haul road for trucks that carry fill dug on land. Most of the fill, however, was dredged from the lake, hauled in scows, and placed by derrick.

CONCRETE RETAINING WALL of dock is dowelled to the rock at the elevation of the harbor bottom. In this photo, excavation is complete, and the area is ready to be flooded.

About 100,000 yd of fill, however, was dug on land and hauled over the completed work to open cells. The top of the cofferdam served as a roadway for these trucks, and we had to keep this in mind in locating the cells so that there would be no curves too sharp for the trucks to maneuver.

At the dumping location, the trucks were turned around for the return trip by a steel turntable fabricated for us by the Wallner Welding Supply Co. of Duluth. All cofferdam cells were capped with heavy rock to prevent scour from extreme wave action.

The top of the cofferdam rose about 13 ft above water level. Because of the possibility of overtopping and damage from waves larger than the cells were designed for, we installed specially designed flood gates. Fortunately these gates were not needed.

All of the derrick boats and barges on this job were designed and built by Dravo at our Pittsburgh shipyards. The fleet was towed down the Ohio River to Cairo, Ill., up the Mississippi River and the Illinois Waterway to Chicago, and across Lake Michigan and Lake Superior to the site. The entire trip was about 2,400 miles.

Dravo is building Taconite Harbor for Erie Mining Co. which is owned by Bethlehem Steel Corp., Youngstown Sheet and Tube Co., Interlake Steel Corp., and the Steel Company of Canada, Ltd. Erie Mining Co.'s plant 73 miles inland from the harbor, will be the world's largest processing plant for the recovery of iron ore from hard taconite rock.

Muck 30 feet deep where a road must go!

...BUT GERKE AND CITIES SERVICE KEEP THE JOB ON SCHEDULE

North of Ladysmith, Wisconsin, Route 27 was practically floating in the swampland it cut through.

To Lawrence Gerke—sometimes known as "Gerke from Merrill"—went the difficult repair job. A job that involved working in a virtual lake, with muck and water up to 30 feet deep!

Under these conditions it would seem almost impossible not to fall behind the three-month schedule for completion . . . but "impossible" isn't in Gerke's vocabulary. And so, he pulled the job through, directly on schedule.

"But I couldn't have done it without the flawless performance of Cities Service lubricants," says the quiet man from Merrill. "Throughout the rugged months of work in muck and marsh, my equipment operated constantly without a single lubrication failure, thanks to Cities Service C-500 Motor Oil and Trojan Greases. When the chips are down, Cities Service comes through."

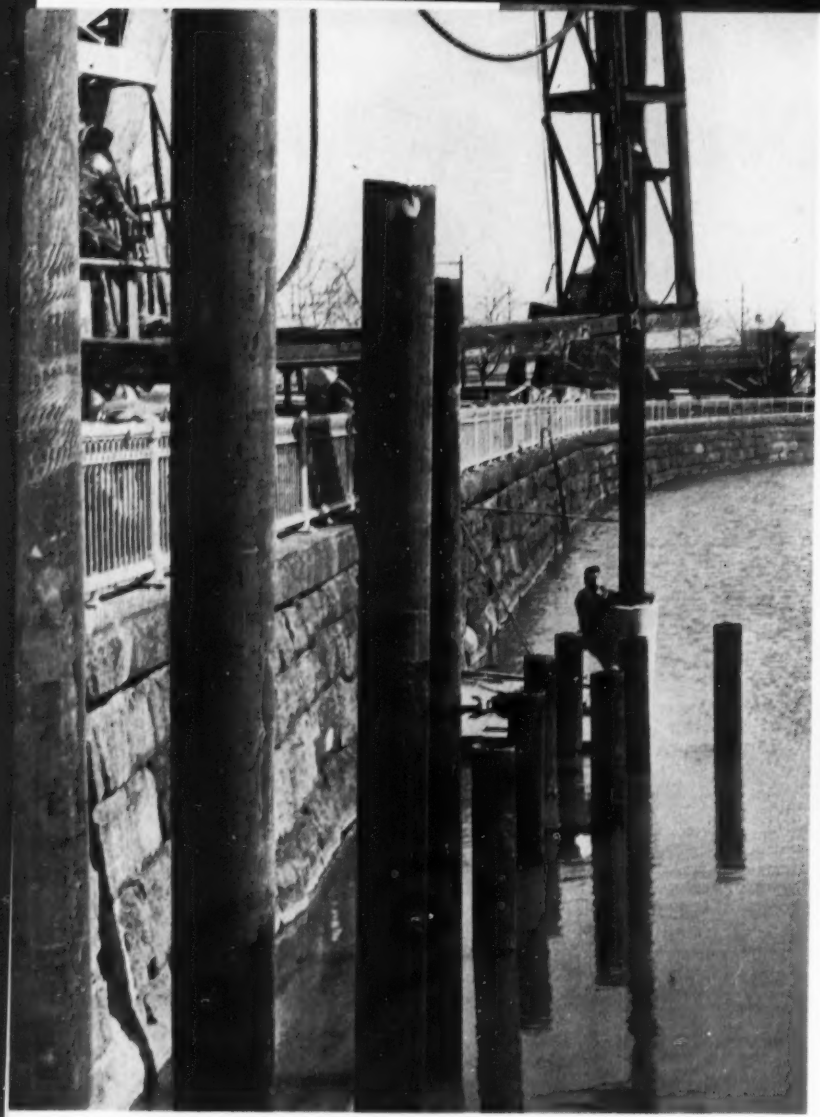
Mr. Gerke puts it in a nutshell. You can always count on Cities Service when the chips are down. But why wait until then? Why not start using Cities Service lubricants this week? A Cities Service Lubrication Engineer will gladly help you select the precise type for your equipment. Or, if you'd like more information, write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

"Gerke from Merrill" is the way Lawrence Gerke likes to be known. But he's better known for getting things done . . . and he uses Cities Service lubricants for the same purpose.

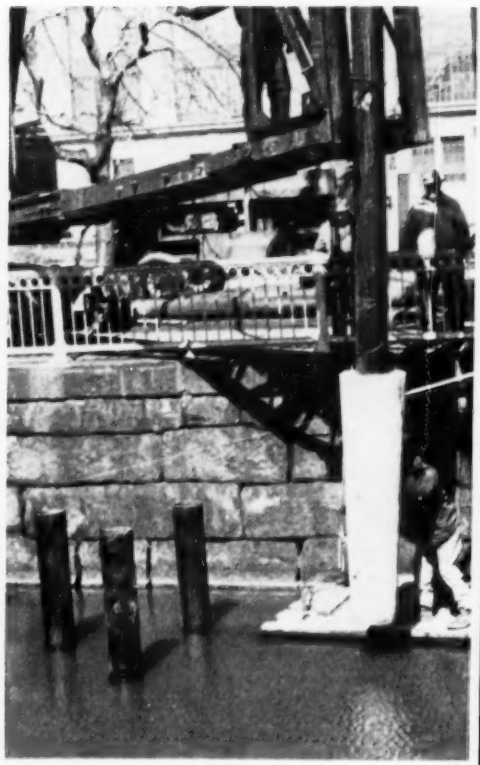
200,000 Yards of Borrow Dirt fill marsh where 100,000 yds. of muck were removed. Despite grueling work and tight schedule, Gerke finished on time . . . without a lubrication failure!

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS



DRIVER lowers concrete-jacketed pile into position on Cambridge shore of Charles River. Jacket permits pile to sit in river bottom crust instead of penetrating it to bedrock.



SPOTTING the pile is done the same as with conventional ones. But once pile is

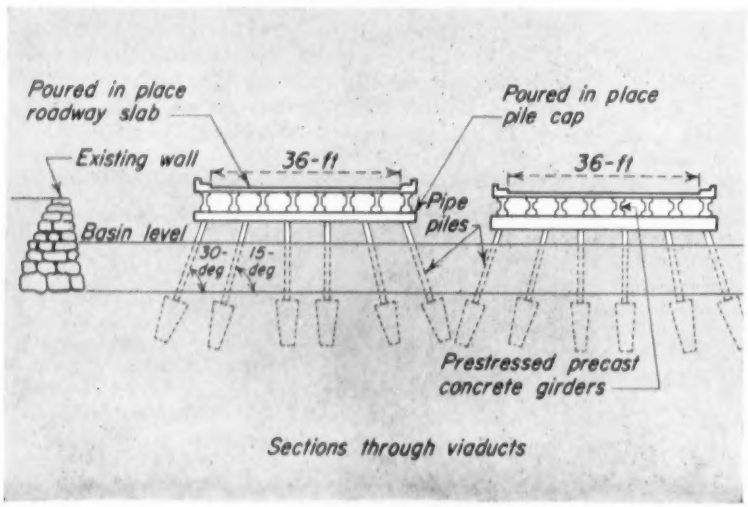
New Pile

A NEW TYPE PILE is the key feature of an unusual viaduct job now under way on the Charles River at Cambridge, Mass.

The pile, fitted with an exterior concrete jacket at its tip, is designed to sit in the river bottom's crust instead of penetrating through it to firm bearing. It serves as a combination friction and bearing pile.

About a year ago, Boston's Metropolitan District Commission decided that traffic was getting out of hand on the Cambridge side of the Longfellow Bridge. The bridge connects Cambridge with Boston over the Charles River. Traffic accidents were on the increase. MDC, in an effort to improve conditions, allocated $3 million to a road reconstruction program for the area.

Its plan was to rebuild the bridge's approach roads, Cambridge Parkway and Memorial Drive; connect the two with cloverleaf spurs; and run through traffic



SECTIONS through viaduct show typical construction. Piles are driven to designed bearing. Then, they are bridged with concrete caps and precast, prestressed stringers.

located, only a few hammer blows are needed to drive it. Pile sits in crust.

WORKMAN first checks location of pile for accuracy by measuring with rule from spotting plank run in from the shore. He next checks pile's plumb before driving it.

Appears on Boston Waterfront

under the bridge by means of two additional roadways measuring 36 ft wide and 2,000 ft long.

These two additional roads were to pose a problem. MDC's initial plan was to fill in portions of the river where the roads would be placed. But a check with federal authorities disclosed that the law prohibited any alteration in the river basin.

Decide on Viaducts

MDC had no choice but to design the river portions of the roadway as viaducts.

"That seemed simple enough," said Benjamin W. Fink, director and chief engineer for the MDC's Park Division handling the job. "But building the viaducts would have meant driving piles at least 90 ft long to support the roadway. This threatened to run us over our budget."

So MDC decided on building bents consisting of 12 piles each. These would be connected with poured-in-place concrete caps. Precast, prestressed concrete stringers would connect bents and support a concrete deck.

MDC gave Brask Engineering Co., structural engineers, the job of finding a way to reduce piling costs. Brask came up with the crust-riding, concrete-jacketed piles.

Basically, the pile consists of an 11-in. dia steel pipe welded at its bottom to a 15-in. dia steel plate, 1-1/8-in. thick. Cast around its tip is an 8-ft-long reinforced concrete jacket that tapers from a 15-in. dia up to a 22-in. dia.

The pile penetrates the river bottom to a depth of about 6 ft. The tapered tip acts as a wedge. The deeper it goes, the more resistance it develops. (The river bottom here averages 10 ft of hard pan, 70 to 80 ft of clay, then hard pan and bedrock.)

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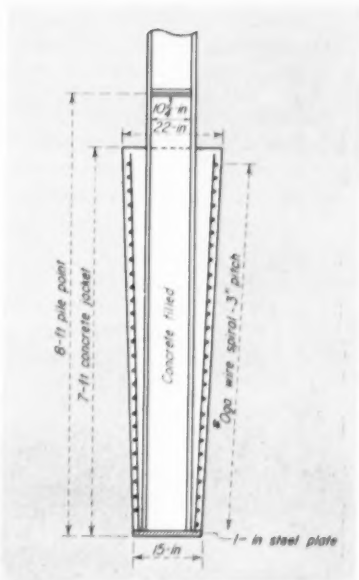
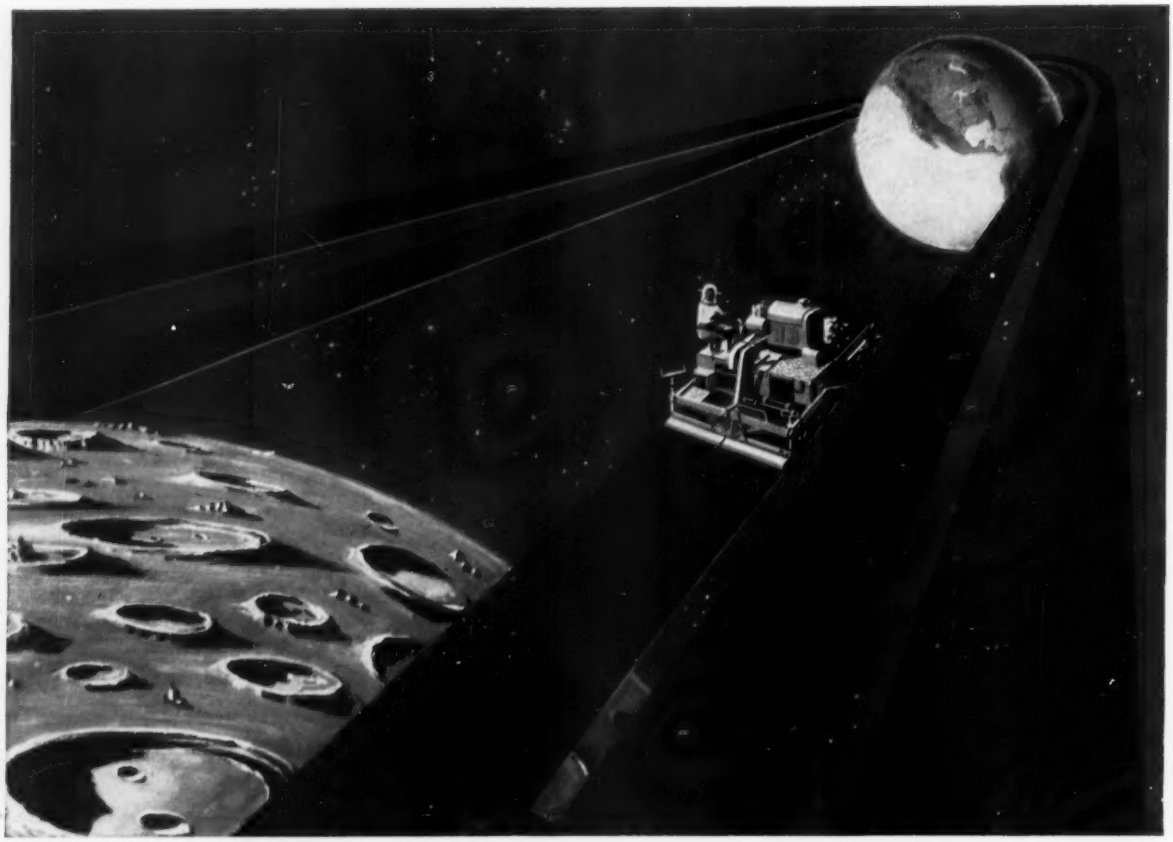


PILE is a pipe covered with a jacket of reinforced concrete with base plate.



The 5th (s)trip to the moon has been started

By conservative estimates, the thousands of Barber-Greene Finishers throughout the world have started paving their second million miles. That is the equivalent of more than four trips to the moon. The current design of the Model 879-B is based on that experience.

Improving the Barber-Greene Finisher is not new. Scores of major improvements have been embodied in its design since it was first released to the field 20 years ago. Each engineering advance is backed by experiences in laying every type of mix in virtually all conditions.

Latest improvements include:

New transmission — increases both operation and travel speeds, still provides 12 forward speeds for a wider range of operation.

Higher speed tamper — permits faster laying speeds and reduces maintenance costs.

New crawlers — precision-drilled pads and larger pins further decrease maintenance costs.

New power unit — 20% more power for pushing bigger trucks up steeper grades, with a greater reserve for high altitude and higher operating speeds.

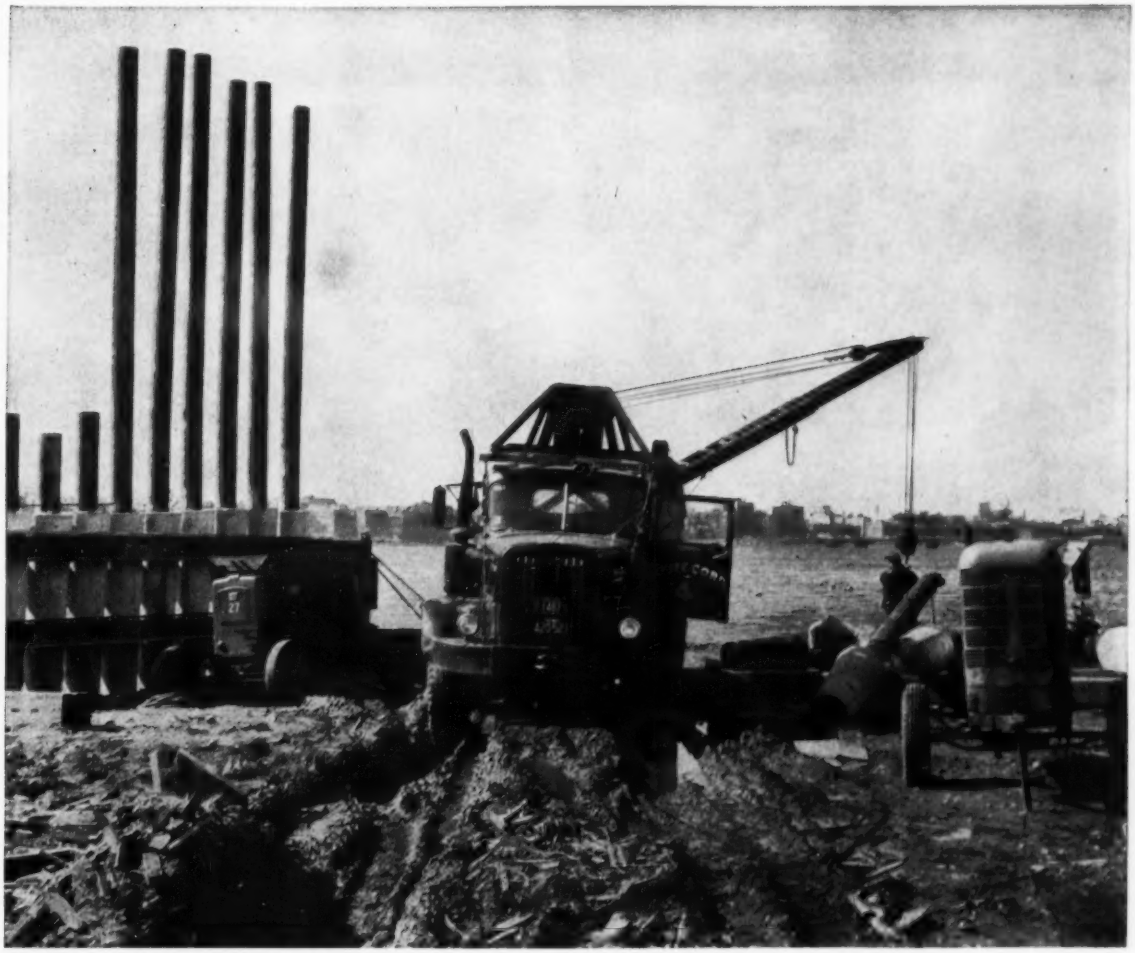
Note to Barber-Greene Finisher Owners: *You can have any and all of these improvements on your machine. Necessary parts are available in kit form for each separate modification. Write for the folder describing the various kits.*

57-5-F

Barber-Greene BG

AURORA, ILLINOIS, U.S.A.

CONVEYORS . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT



TEMPLATE made from sections of H-beams supports pile points in vertical position. Additional lengths of pile then are welded to pile tops as needed. Piles are delivered to the job from an off-site casting yard of the New England Pipe Co.

MDC awarded placing of the piles along with a $3 million contract for the viaduct work to the J. F. White Co. of Westwood, Mass. Before White could begin, though, it first had to build a temporary work road out into the river on which to rest pile driving equipment.

White built the road simply by dumping some 26,000 yd of rock between the planned parallel paths of the two roadways that would curve out over the river. This road would be removed at the completion of the job.

Piles Readied

During building of the temporary road, the contractor readied the piles. These are being cast as the job progresses by New England Pipe Co. of Newton Upper Falls, Mass., and are trucked to the job as needed. At the job site, additional lengths of steel pipes are welded to the jacketed pile points.

The pile is lifted into the pile driver lead. It then is spotted, plumbed, and driven. Only 20 to 25 hammer blows are needed to drive the pile to the designed penetration.

The two outer pairs of piles for each bent are driven on 30-deg batters; the two inside pairs are driven on 15-deg batters; and the two center pairs are driven plumb.

Since the pile is not driven to refusal, cut-off and penetration guide marks are made on the pipe to indicate when designed penetration has been reached.

Pouring Pile Caps

Piles are filled with 3,000-psi concrete, and work begins on caps. The cap for each bent is 42 ft long, 6 ft wide, and 2 ft 8 in. thick. They are formed and poured in place. Placing of precast, prestressed stringers follows.

These, too, are cast and stressed by New England Pipe Co. They average 60 ft long, 3 ft 5 in. high, and 2 ft wide. Once on the job, they are set into place on 7-ft centers over pile caps.

Plywood slabs then are placed flush against the top flange of the girders to receive reinforcing steel and a 6-in. concrete slab. Three plys of membrane waterproofing will go over the slab followed by a 1-in. course of dense asphalt and a 1¼-in. surface course of bituminous concrete.

Any "first" usually brings with it the drama of exploration. This held true with New England's attempt to find a way to cast the odd-shaped pile points. After several false starts, the company came up with a casting method that at the forming stage closely resembles the way in which lead sinkers used for fishing are moulded.

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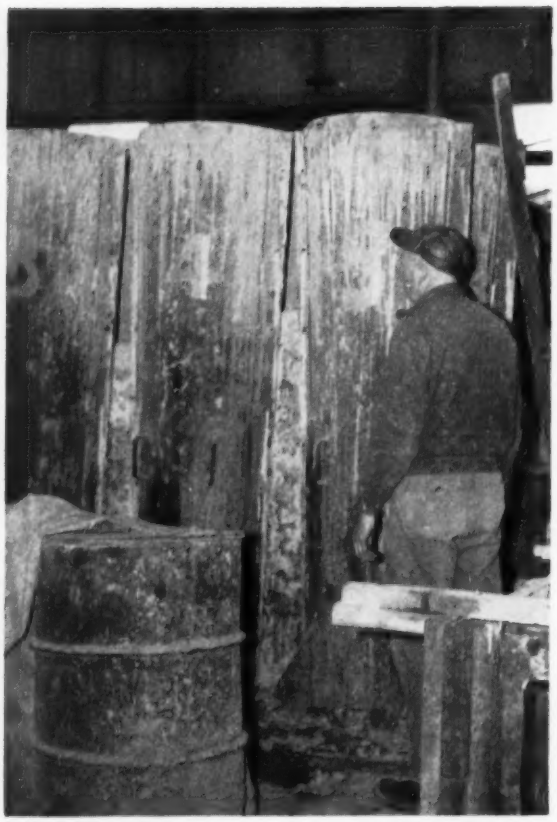
IRONWORKER welds pile to steel base plate. Next come reinforcing rods and a wire cage. Unit then is lifted into casting form.



FORMS resemble molds for lead sinkers. They are collapsible and are made to the tapering shape and height of pile points.

Casting the Pile Points

PILE points are loaded at yard for transportation to the job as they are needed.

Before actual casting operations begin, pile, steel plate, and reinforcing for the pile point are fabricated into a unit. The pile first is welded in a vertical position to the steel plate. Eight ¾-in. round reinforcing rods also are welded vertically to the steel plate, equidistant from each other.

Next, a cage of 5/16-in. wire bent in a spiral cone-shaped cage 7 ft high is slipped over the pile and around the reinforcing rods. The entire assembly then is lifted and placed within the forms.

Forms are steel sheeting bent to the shape of the tapered pile points. Forms for each point are made in two halves. One half is a stationary upright form; the other half is removable. Eight points are cast simultaneously. This is done by lining up eight of the stationary form halves and bolting them together with steel brackets in a vertical position. Pile units then are placed, and the outside forms are bolted to the stationary ones. Pile points next are poured with 3,500-psi concrete.

These steam cure overnight under a tarpaulin covering. The next day, outside forms are released and the piles are lifted and brought to the job where they get further curing.

Cast Girders Too

Girders are cast and stressed in New England's yard where the pile points are manufactured. Most unusual feature of the casting and stressing operation is that wires are jacked one at a time instead of in congress.

Normally (in pretensioning) wires are anchored to an abutment beyond one end of the girders. Then, all wires are jacked at the

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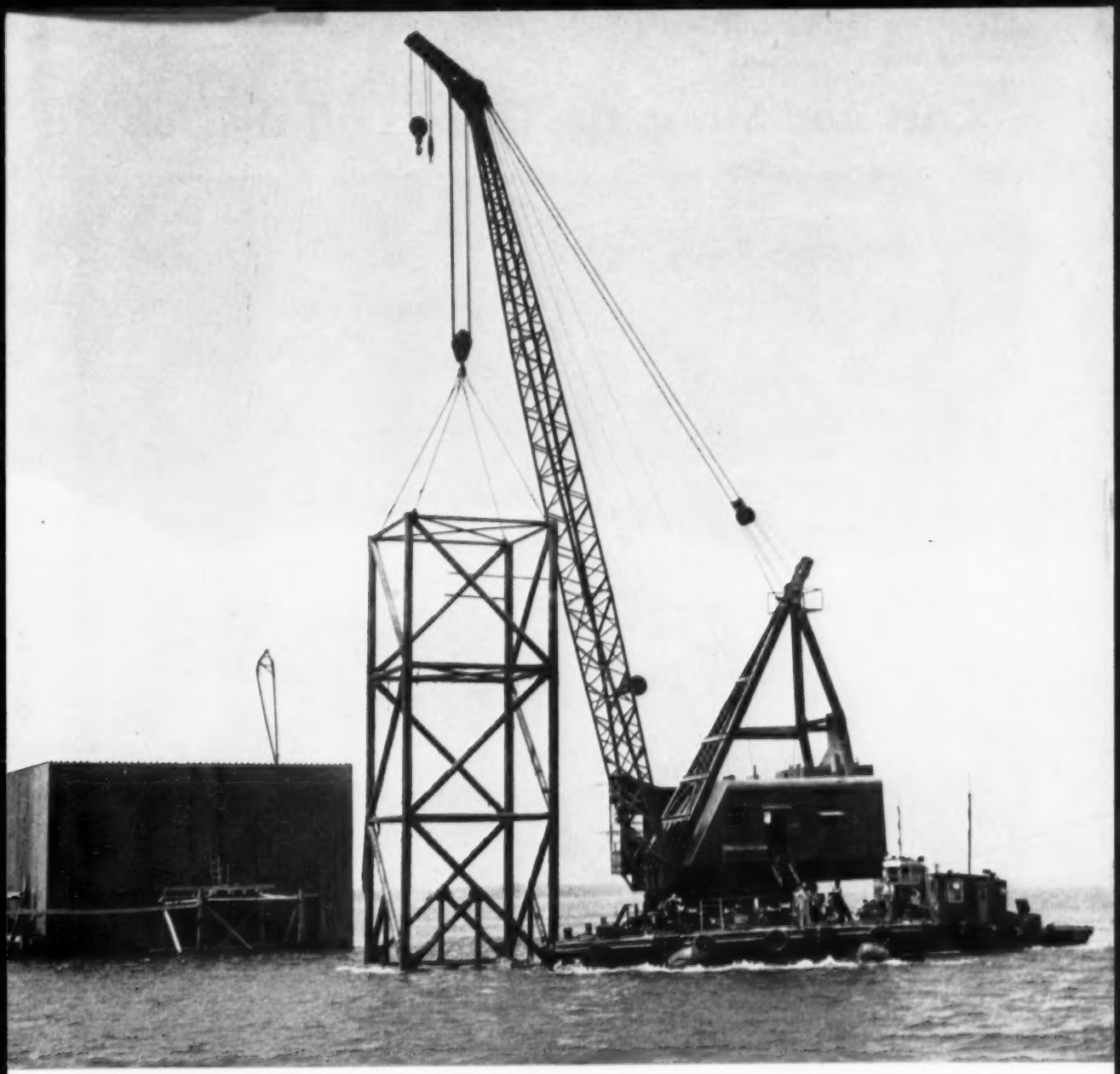


WIRE ROPE AT WORK

A great bridge is not erected overnight, and months of dogged effort are required before the span begins to take shape. Here's a scene that was common during the early work on the Rappahannock River Bridge—a $15,000,000 project in eastern Virginia. When completed, the bridge will link White Stone and Greys Point, thereby crossing the river at one of its broadest parts.

The photograph shows equipment of the Diamond Construction Company positioning a guide tower. The crane was rigged with Bethlehem wire rope, 1-in. Purple Strand. Bethlehem rope was also used for handling caisson domes, and for excavating through the caisson wells. Almost anywhere you looked, in fact, some of this tough steel cable could be seen in action, lifting, lowering, or pulling heavy loads.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:

CONSTRUCTION • EXCAVATING • MINING • QUARRYING • PETROLEUM • LOGGING • MANUFACTURING

Cast and Stress the Girders off the Job

ELECTRIC GANTRY rides over casting bed of New England Pipe Co. It positions Insley concrete bucket and carries reinforcing steel as well as forms to places where they are needed. Viaduct job girders are 60 ft long. Casting bed measures 376 ft.

same time from the girder's opposite end.

Before pulling wires to their full elongation, however, it is standard procedure to give them an initial jacking to eliminate slack before the pull. New England figured that stressing wires to their full designed elongation individually would eliminate this normal two-step procedure, and that's the procedure they follow.

"This gives us maximum control of the designed elongation," said Harry Barber, Jr., casting superintendent.

Stressed One At A Time

This is the casting and stressing procedure. Wires first are anchored to an abutment by a holding templet. This templet is held 3 ft beyond the abutment by strut assemblies of steel pipe. Wires then are run to the girder's opposite end where they are held in position by a second templet. Each wire end is fitted with a stressing vise. The jack then is attached to one of the wires. It exerts a 7-ton pull, elongating the strand about 30 in.

Workmen push the jacking vise tightly into the templet after the pull to hold the stress. This procedure is repeated for each of the wires until all are elongated to their designed length. There are 50 wires in each girder.

The jack does not use the abutment as reaction during the pulling of the wire. Instead, it is anchored

continued on page 227

"EXTREMELY SATISFIED" say Graves Brothers of their LIPPMANN "CHIPPEWA"

Portable Secondary Crushing Plant

Graves Brothers plant at Blevins, Ark. turning out 1100-1200 yards of specified material per day.

July 28, 1956

Lippmann Engineering Works, Inc.
Milwaukee, Wisconsin

Gentlemen:

Our Lippmann secondary crushing plant is turning out from 1,100 to 1,200 yards of GB-3 material a day here in our pit in Blevins, Arkansas, with about 15% being crushed through your 30 x 26 roll crusher on the plant. The size rock going through runs up to 3" to 3½", which in our opinion, in this size roll, is very good crushing.

The whole unit is turning out this kind of performance making us extremely satisfied with the operation.

Yours very truly,
GRAVES BROTHERS,
CONTRACTORS

Signed: W. L. Graves

More and more sand and gravel producers as well as contractors are buying portable plants so as to work near-the-job pits, cut trucking and transport costs. Those, like Graves Brothers, who choose Lippmann portable plants get the kind of output that makes profits and the kind of product quality that keeps their customers happy.

Whether your needs in the portable line call for complete dual crushing plants, primary, secondary, screening or washing, or combinations of these — there's a proven Lippmann-engineered arrangement to meet your requirements.

Features of Lippmann portable plants are stability and mobility — the balance between components that requires no blocking or jacking — for quick and easy set-up. Owners also cite the exceptional performance of individual components such as Grizzly King and Rock Ram jaw crushers, superior Roll Crusher secondaries, Screen-All screens and Ever-Seal conveyor idlers that never need greasing.

Want more data on Lippmann-engineering for *your* requirements, either portable or stationary? Contact your Lippmann Distributor, or write direct. Lippmann Engineering Works, Inc., 4650 W. Mitchell St., Milwaukee 14, Wis.

1620-57-4

Write for Lippmann literature

Lippmann also makes the "Mohawk" Primary and "Comanche" Dual Portable Crushing Plants. Write for bulletins 1610 and 1600 respectively.

LEW LIPPMANN

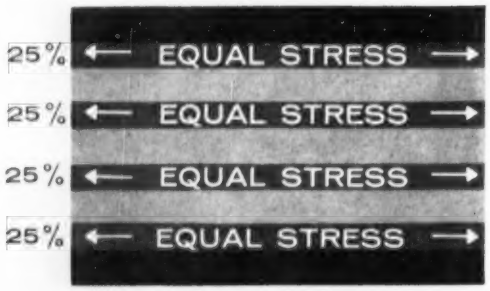
SINCE 1923

CRUSHERS FEEDERS SCREENS CONVEYORS CRUSHING & WASHING PLANTS

STOP PAYING FOR "LAZY" PLIES THAT SHORTEN BELT LIFE!

BOSTON'S Balanced Belt Construction equalizes stress!

CONVENTIONAL BELT CONSTRUCTION



BBC-BALANCED BELT CONSTRUCTION

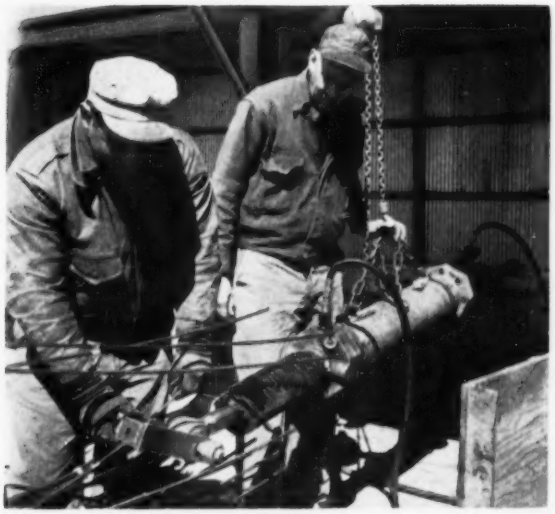
BBC — Balanced Belt Construction equalizes ply stress — every ply pulls its full share of the load! BOSTON'S exclusive manufacturing methods eliminate "lazy" plies which put extra strain on other plies and cause premature rupture and belt failure.

BBC is the result of two advanced BOSTON processes: *Electro-Tensile Control*, which electronically controls ply tension; and *Rotocure* the only continuous method of vulcanization, which assures uniformity throughout the belt.

With Balanced Belt Construction, BOSTON belts set entirely new standards of longer, trouble-free service and greater economy.

Your BOSTON man will be glad to demonstrate the advantages of Balanced Belt Construction to you!

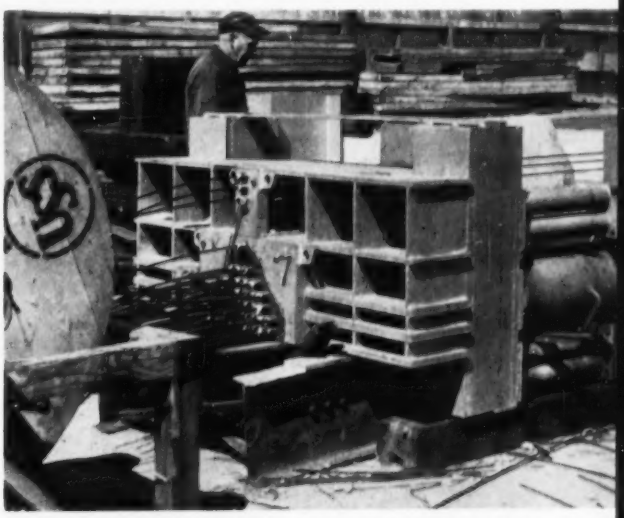
BOSTON BOSTON WOVEN HOSE & RUBBER CO.
BOSTON 3, MASSACHUSETTS



WORKMEN attach single strand of wire to jack prior to pull. Wires are tensioned one at a time to 176,000 psi, then anchored.

STIRRUPS are fitted around stressed wires before girder forms are set. Girder (rear) has been poured and begins curing cycle.

FORK LIFT truck carries concrete bucket from mixing plant at yard to casting bed where gantry lifts it and carries it to where needed.



ANCHOR templet at end of girder opposite pull is fitted with jacks that react against abutment. Reversing these releases wire stress.

NEW PILE POINTS . . . **continued from page 224**

in the rear to a steel deadman and literally pulls the wire to the designed length.

When all wires have been pulled, the girder then is formed and poured with 3,500 psi concrete. Steam curing follows. After curing, wire tension is relaxed from the end that had served as the anchor end.

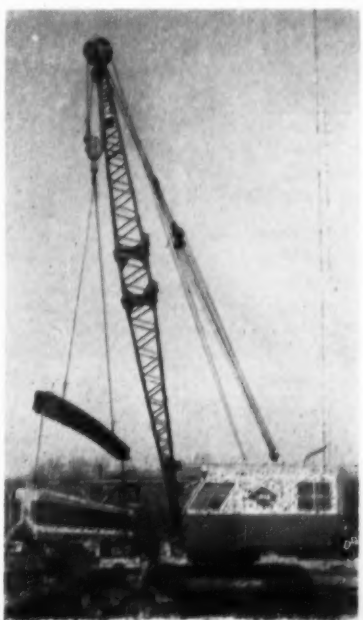
Usually, wires are released at the same end from which they are pulled. Releasing wire tension from the anchor end is simpler and faster.

Jacks are fitted to the anchor templet. Their rams thrust against the abutment until jacks take up the tension. The strut assemblies then are removed. Merely releasing the jacks lets the templet draw up to the girder end, relaxing the tension on the strands and completing the stressing operation.

Wire ends next are burned off, ends are mortared, and the girders are ready for shipment to the job.

Personnel

John J. Gallo, is resident engineer for the Park Division of the MDC. Richard McDermott is White's general job superintendent.



CRANE lifts huge prestressed, precast girder from casting bed. It will set girder down into place in storage area for further curing.

SYMONS® SCREENS

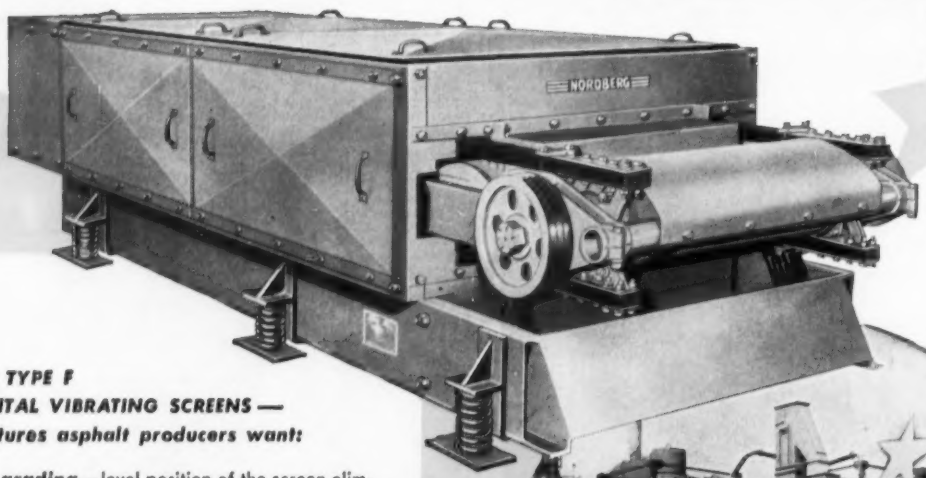
for accurate sizing in bituminous

Aggregate used for multi-aggregate bituminous mix *must be accurately sized* to meet today's exacting specifications. That's why prominent asphalt plant manufacturers *standardize* on Symons Type F Horizontal Vibrating Screens.

Read why these leading manufacturers specify Symons Screens . . . good reasons why you too will benefit with Symons Type F Screens handling your separation jobs.

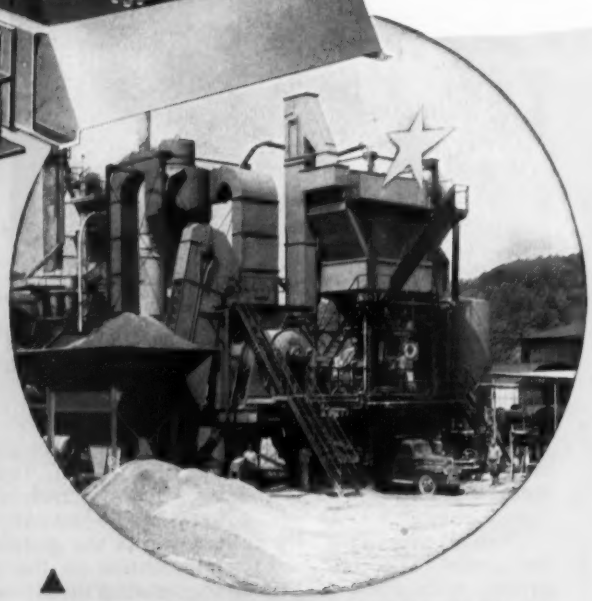
Write for literature today.

NORDBERG MFG. CO., Milwaukee, Wisconsin



SYMONS TYPE F HORIZONTAL VIBRATING SCREENS — Features asphalt producers want:

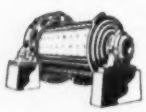
- ***Better grading***—level position of the screen eliminates bouncing and cascading of material along deck and leaves the full opening of the mesh available for screening. Positive action thoroughly agitates material and more quickly stratifies it for closer sizing.
- ***High capacity***—positive vigorous screening and conveying action gives the "F" Screen greater capacity than is possible with inclined type screens.
- ***Adaptability***—installed in a level position with low overhead requirements, the "F" Screen shortens elevators, simplifies construction and reduces overall dimensions of the plant. Being free from vibration, there is no tendency to shake scales or other measuring devices.
- ***Multiple separation***—with multiple decks and many varied screen sizing possibilities, including gap, lower deck, versatility of sizing to meet any specification is possible with the "F" Screen.
- ***Low maintenance***—drive unit with bearings and motor are located outside the screen housing, away from dust and heat.



Standard Equipment on SIMPLICITY Plants. "We have long standardized on the use of Symons Screens in Simplicity Plants. One big reason is that highway engineers realize that accurate screening means much to the durability of finished asphalt pavements," says Wm. C. West, of The Simplicity System Company.

SYMONS PRIMARY GYRATORY CRUSHERS

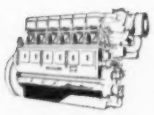
SYMONS CONE CRUSHERS



GRINDING MILLS

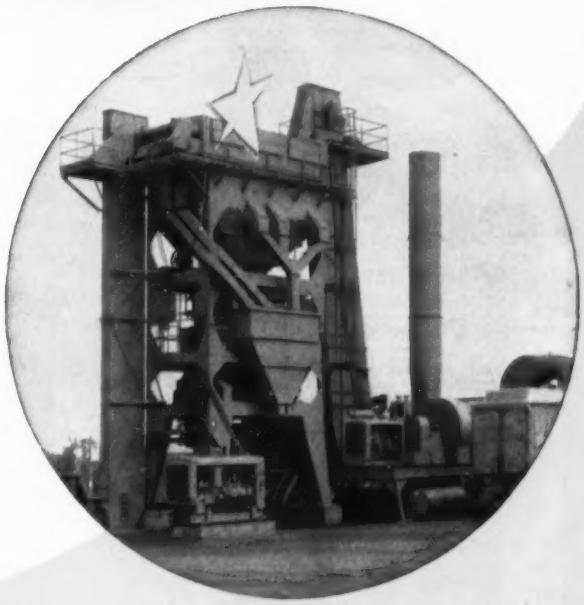
SYMONS V-SCREENS

ROTARY KILNS and COOLERS



DIESEL ENGINES — 10 to over 12,000 H.P.

ARE THE CHOICE
mixing plants



Standard Equipment for MADSEN. Madsen Works has used Symons Screens exclusively (unless otherwise specified by customer) since 1930. Here's why, says W. M. Madsen, V.P., Research & Development:—"Accuracy of sizing with a minimum of carry-over; simple to adjust; easily serviced; rugged, simple, accessible and well designed."

Used Exclusively by WARREN BROTHERS CO. "In the past eight years we have installed close to forty Symons Screens of various sizes. Our satisfaction with their performance must be apparent," says R. C. Paine, Chief Engineer.

Preferred by KOEHRING-WATEROUS, LTD. "We use Symons Screens because they have complete customer acceptance. We like the design which permits the drive unit to be mounted completely outside a dust enclosure over the screen, away from dust and heat," says N. L. Elliott, Manager, Road Equipment Sales Division.

Specified by STANDARD STEEL CORP. "We utilize the Symons Screen on all our plants and find them to be especially suitable due to their ruggedness, high gradation control, and because the operating mechanism is away from the heat," says M. B. Preeman, Manager, Road Machinery Division.

NORDBERG MACHINERY **NORDBERG**

SYMONS SCREENS NORDBERG

MACHINERY FOR PROCESSING ORES and INDUSTRIAL MINERALS

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KNOWN THROUGHOUT THE WORLD

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THE MOST POWERFUL NAME IN CRANES

Fifty years of experience applied directly to your handling problem, because every ORTON crane is custom-built, incorporating the most modern tested features as well as your requirements. Custom-built quality and utility at production-line prices and delivery — that's ORTON.

Every construction handling problem is unique. We want to start with your requirements. Write ORTON CRANE & SHOVEL CO., 608 S. Dearborn St., Chicago 5, Illinois.

NOTE: ORTON is also the oldest manufacturer of buckets. ORTON buckets are so superior that many users specify them on every crane they buy regardless of make.

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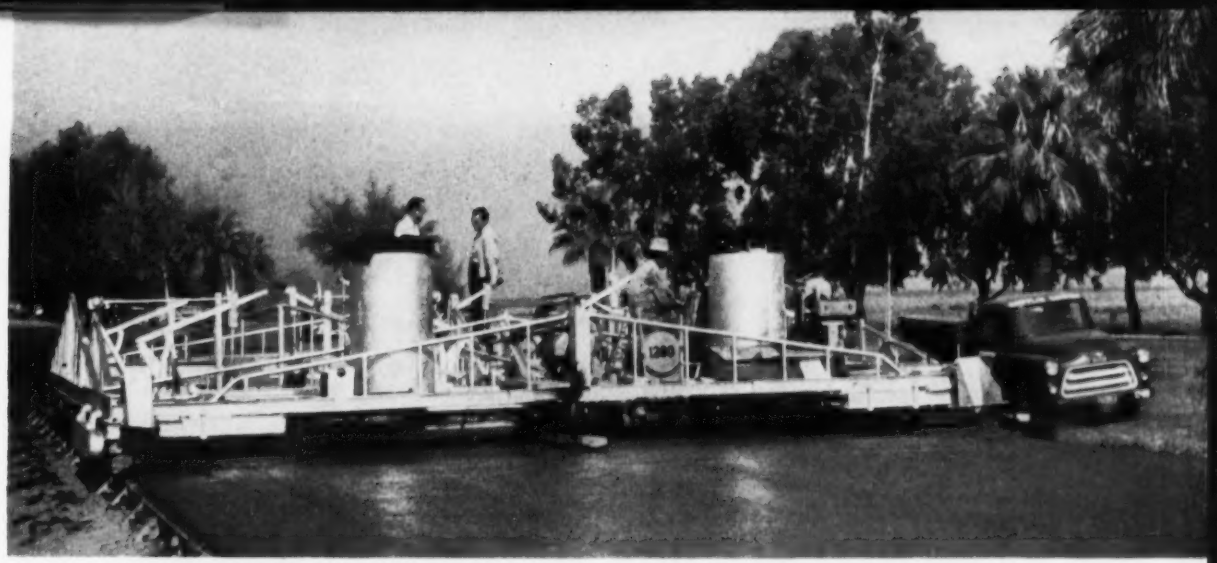


MECHANICAL FINISHER developed by contractor on a California road resurfacing job screeds two 12-ft lanes of concrete paving to close tolerances. Self-propelled rig measures 20 ft in length. It gets a smooth surface by making several passes over pavement.

Finisher Screeds 24-ft Widths

A CONTRACTOR-DEVELOPED finisher that screeds two 12-ft lanes of concrete paving at a time to close tolerances is a standout performance on a California highway job.

The finisher—which is self-propelled—measures 20 ft in length. It takes several passes over the fresh pavement to produce a surface meeting the exacting specifications of the California Highway Department.

Griffith Co. of Los Angeles, the contractor, developed the rig for an unusual four-lane divided highway job between Los Angeles and the Central Valley. It involved the resurfacing of an old, steep road.

Highway engineers decided to use the existing pavement as subgrade without further preparation wherever it appeared to be adequate. Specifications called for 8 in. of concrete placed over the old road. Concrete was to go directly between steel forms pinned to the edges of the old paving. Finished work would include 10-ft-wide concrete shoulders.

For the job, Griffith decided to employ the special finishing machine it had been developing that was capable of laying a slab across an entire two-lane width in a single operation.

The two-lane finisher was cannibalized from two standard floating machines. These are held together by tubular steel trusses. A 6-in. roller foward and another roller aft screeds the surface. Between the rolls—each is 24 ft long—is a float made up of a series of steel-clad timbers arranged in a herringbone pattern.

Boards on the float are so arranged as to permit adjusting them to make a plane section or a crowned section. (On this job, the crown of the original pavement was retained.) Two tanks set on the frame feed water to the screed roll. Handles are set on the frame to permit hand adjustments of rolls and herringbone floats to any desired height. A Ford V8 engine provides power.

At the front of the float near its center, Griffith placed a short board that could be moved in either direction to permit throwing a windrow of accumulated mortar to either side as needed.

The Paving Spread

A paver mixes and deposits concrete between forms. This is levelled off by a spreader followed by a transverse float that makes the strike off. This machine also places tie bars.

These are set on 30-in. centers by an attachment fixed to the rear of the floating machine. It consists of two discs having 90-in. circumferences with notches cut in their edges the distance of the bar spacing.

As the machine moves, a work man places the bars in the notches, and the discs, rotating with the forward movement of the spreader, press the bars 4 in. into the concrete.

The special two-lane finisher follows, floating and finishing the surface. The machine makes several passes to level off the inequalities and to leave a smooth single operation. This is only the second time that two-lane paving has been done in California.

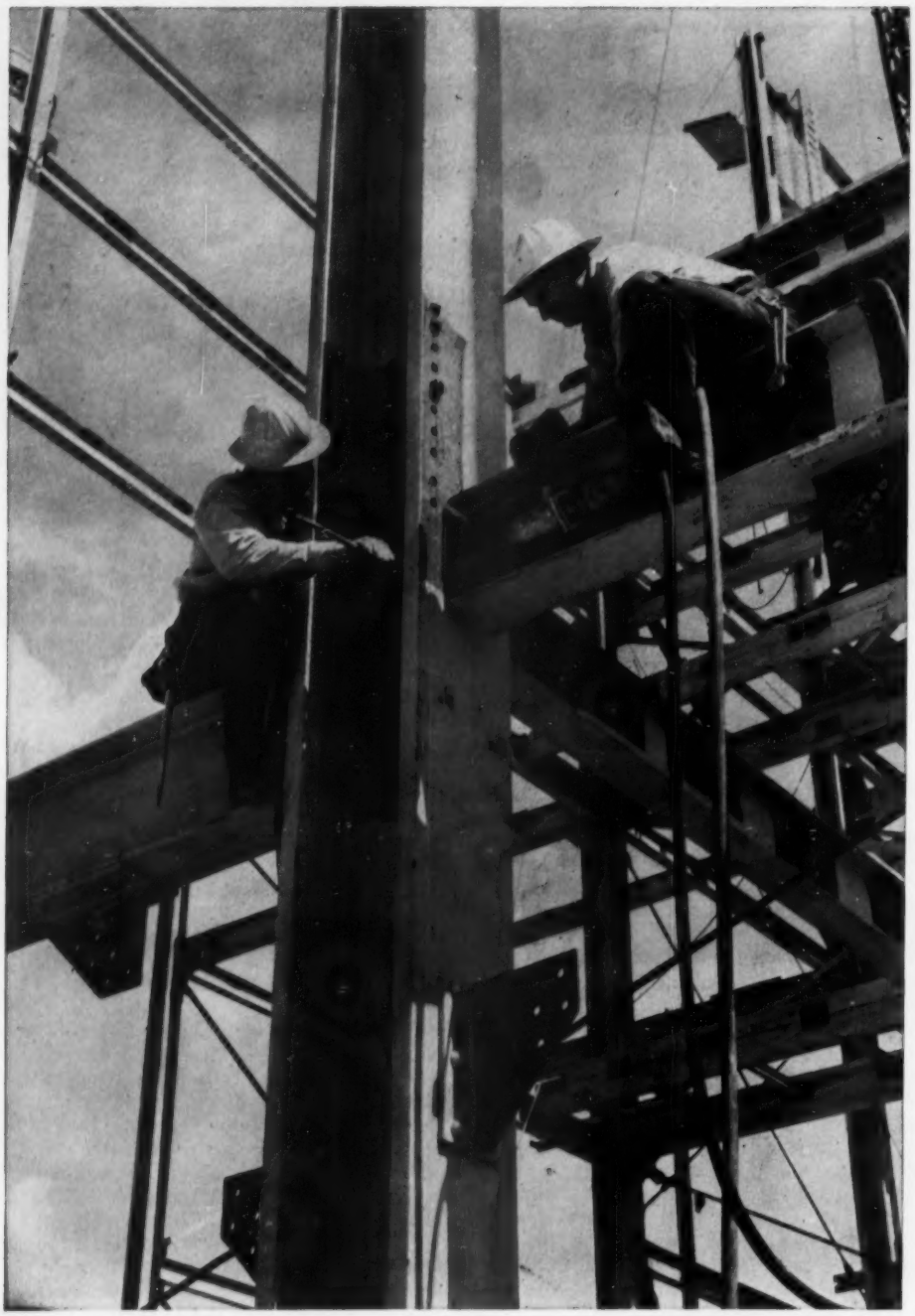
Reasons for not doing it more often include specification requirements that pavements have a super-smooth finishing. California highway engineers believe that such pavements are less susceptible to damage by impact from fast moving vehicles, and these specifications can more easily be met on narrower widths.

California tolerance of ⅛ in. in 10 ft is not in itself unusual. But specifications require a delayed finish and the use of special floats until all concrete subsidence ceases. The contractor, in addition, has to grind off inequalities in excess of ⅛ in. in 10 ft.

These requirements in the past have ruled out the use of long wheel-base finishers. But Griffith's machine meets the test.

Once concrete has cured on the job, transverse joints are sawed every 15 ft, and a longitudinal joint is sawed down the center. Transverse joints are cut by a two-bladed, wheel-mounted pavement saw. The longitudinal joint is made by a single-blade machine.

Bruce McDonald superintends the job for Griffith.



USING WRENCHES that shut off automatically when a pre-set torque is reached, two crews are placing more than 130,000 bolts as steel goes up for the first section of Duke Power Co.'s generating station.

Bolt Crews Place 1,000 a Day

TWO THREE-MAN bolting crews are placing an average of 1,000 high-tensile bolts a day as steel goes up on the first section of one of the South's biggest projects—Duke Power Co.'s steam generating station near Belmont, N.C.

The Allen Plant Project, which ultimately will cost more than $100 million, is being built in stages by Duke's own construction forces. The first section, now under construction, requires more than 130,000 high tensile bolts.

Except for about eight hundred 1-in. bolts, all are ⅞-in. long, installed with hardened washers and hexagonal nuts. Working in the

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Best in the Long Run!

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MAGNETOS

Steadily improved electrical and mechanical characteristics give these famous Magnetos greater power for lightning-fast starts, PLUS the traditional built-in stamina that assures *years* of constant, trouble-free ignition in Construction Equipment engines. This is why these power-packed Magnetos are so steadily used as original equipment by so many leading engine builders.

On all your present equipment you can have this instantaneous spark efficiency and matchless dependability at all engine operating speeds and loads. For, there's an American Bosch Magneto replacement precisely engineered for all spark-ignited engines—in dozers, gas-engine driven compressors, pumps, graders, paving machines and spreaders. Moreover, American Bosch can serve you well at your job-site, through one of the largest and most efficient field service organizations. There's an AB Service Agency near you. Write to us today for Magneto replacement application data on your construction equipment engines. American Bosch, Springfield 7, Mass. A Division of American Bosch Arma Corporation.

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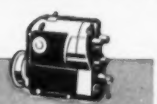
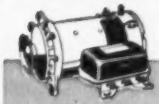

Automotive and Aviation Magnetos


Generators and Regulators

Components for Aircraft Engines

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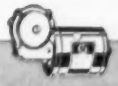
Small Electric Motors


Electric Windshield Wipers

Diesel Fuel Injection Equipment

WRENCHES are checked daily by running up several bolts on a Skidmore-Wilhelm direct reading hydraulic calibrator (left). About once a week, setting is adjusted by twisting the wrench's torsion bar as it is held in a jig.

This man knows concrete and power trowels

S. PATTI CONSTRUCTION CO.
GENERAL CONTRACTORS
1940 ADMIRAL BOULEVARD
KANSAS CITY 6, MISSOURI

January 14, 1957

Gentlemen:

After trying and testing the troweling machines manufactured by six leading companies, we selected the Master Powermatic for our use.

We found this machine to be superior due to its ability to finish floors better in a more workable manner. Holidays (cat faces) have been virtually eliminated due to the low center of gravity.

The stationary guard ring, dead man control and ease of handling, makes this machine the safest we have used. The simplicity of operation does not require any former knowhow or special instruction.

Maintenance has been almost unbelievable, we finished over 60,000 sq. FT. of hard trowel concrete with no sign of wear to the blades.

S. PATTI CONSTRUCTION CO.

By George M. Klossner
Supt. all cement constr.

Here's the letter Mr. George Klossner, Supt. of cement construction, S. Patti Construction Co., Kansas City, Mo., sent his Master distributor.

Those are strong words of praise from a man in Mr. Klossner's position, but he is sold on the Master "Powermatic" because:

Low center of gravity. The Master "Powermatic" has the *lowest center of gravity of any power trowel on the market.* It's only 14" from the slab to the *top* of the Briggs & Stratton engine . . . and is the most stable, easiest to handle trowel you've ever operated . . . it hugs the slab from start to finish; doesn't try to run away, tilt or buck. Even new operators do a professional job the first time with a "Powermatic."

Power blade adjustment. This saves many a stoop and sore back. You just pull or push a knob on the handle and *engine power* automatically adjusts the angle of the blades to float or finish. You get the exact finish wanted. Master's "dead man" control automatically idles the engine when the operator lets go . . . eliminates wildly swinging handles and other hazards.

Free data sheet. Write for free data sheet or visit your Master distributor today and find out about the "Powermatic" yourself. No obligation, naturally.

MASTER

MASTER VIBRATOR COMPANY
147 Stanley Avenue • Dayton 1, Ohio

BOLT CREWS . . .
continued

air, with scaffolding to hang and move frequently, the crews average 400 bolts a day. On the ground or the mezzanine floor, where scaffolding is not required, production has reached 10 bolts a min at times. This averages out to about 1,000 bolts-in-place for each work day.

The crews are using the new size 5340T Ingersoll-Rand Torque Control Impactool. These are impact wrenches that can be set to deliver any torque up to 550 ft-lb and shut off automatically when the preset torque is reached. The operation is entirely automatic. The operator does not have to "feel" the proper torque before shutting off the wrench.

At the Allen Plant, the wrenches are preset to stop when bolt tension exceeds 37,000 lb, the minimum suggested by the Research Council on Riveted and Bolted Structural Joints. The two wrenches are checked each morning by running up three or four bolts on a Skidmore-Wilhelm hydraulic calibrator, a direct reading device that is simply clamped to a convenient beam. If a change in wrench torque is indicated by the calibrator, torque is adjusted in a few seconds on a simple jig by altering the twist in the wrench's torsion bar. According to erection superintendent Tate Rust, torque usually needs to be adjusted only about once a week.

The wrenches are lubricated every other day and checked carefully weekly to see that the automatic cut-off valve is properly lubricated.

ONE-MAN SUPPLY CREW...

Right down in the mud of a future boulevard a Clark-Ross* Carrier is delivering material—*where* it's needed. One man operates this self-loading and self-unloading Carrier to deliver any type material from deck steel to tool boxes. It's a dynamic new era for materials movement in the construction industry . . . write for complete details.

Ross Carrier Division
CLARK EQUIPMENT COMPANY
Battle Creek 205, Michigan

CLARK® EQUIPMENT

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Keep out power-robbing deposits in your heavy duty Diesels. Refill with Sinclair SUPER TENOL® for the tough jobs! It helps to eliminate deposits of carbon, varnish and sludge that impair engine efficiency. SUPER TENOL is specially engineered to fight the effects of high temperature, engine over-load and continuous stop-and-go operation. Your engines last longer!

Refill now with Sinclair SUPER TENOL. Contact your local Sinclair Representative or write Sinclair Refining Company, Technical Service Division, 600 Fifth Avenue, New York 20, N. Y. *There's no obligation.*

SINCLAIR

SUPER TENOL MOTOR OIL

STATIONARY PLANTS for washing aggregates are permanent units for long-time use at one site. Semi-portable and portable types are also made for all kinds of material. (Universal and Pioneer photos)

10. Washing Plants—Part I

By W. A. RUNDQUIST
Vice President
Pioneer Engineering Works

CLEAN AGGREGATES are important to the construction industry. Yet producers of aggregates frequently are hard-pressed to meet all requirements for "cleanness." Materials engineers strive constantly to improve concrete and bituminous mixes, and road bases. And while hydraulic methods are the most satisfactory for cleaning aggregates to achieve the desired result, they are not perfect. It is still necessary to accept materials on the basis of some allowable percent of deleterious matter.

In the broadest terms, construction aggregates are washed to make them meet specifications. Specifically, however, there is more to the function of water in processing aggregates than mere washing. Among these functions are:

Elimination of clay and silt
Removal of shale, coal, soft stone, roots, twigs, and other trash
Sizing
Classifying or separating
Dewatering.

The cheapest medium for cleaning aggregates is water. Water for the purpose is available almost everywhere, although in some areas the cost of obtaining it may run considerably higher than is practical. Therefore, availability of the necessary quantity of water at reasonable cost is an important factor in selecting a site for a washing plant.

Because no washing methods can be relied upon to be perfect, and because some materials may require too much time and equipment to make them conform to specifications, it is not always economically practicable to use such materials. It is important, therefore, to test the source thoroughly beforehand to insure that the finished aggregates can be produced at reasonable cost. The project materials engineer can be of immeasurable help in determining

the economic suitability of the material, and generally must approve the source before production begins, anyway. Further, many manufacturers of washing equipment will examine and test samples to determine whether their equipment can do the job satisfactorily. No reputable equipment manufacturer wants to recommend his equipment where he has a reasonable doubt about its satisfactory performance on the job.

Coarse vs Fine Materials

Washing of aggregates can be considered in two parts, depending on the size range of material to be produced:

1. Coarse material—generally above ¼ in. In the washing process it usually is desired to remove foreign, objectionable material, including the finer particles.

2. Fine aggregates—from ¼ in. down. In this case it generally is necessary to remove dirt and silt while retaining sand down to 100 mesh, or even 200 mesh.

Coarse aggregates can be screened into size ranges. With fine materials, however, screening to smaller than No. 8 often is impracticable. Hence hydraulic separation, or classifying, becomes an important operation.

Thus it can be stated that in the ideally set up aggregates washing plant, the material will first be screened to separate the coarse material from the fine so that each may be processed further separately. Undoubtedly, however, this statement will be challenged by those who consider it important to "scrub" the raw material from a gravel pit prior to screening. Frankly, the arguments for both views are valid. The difference stems from the kind of equipment to be used to do the job.

Scrubbing

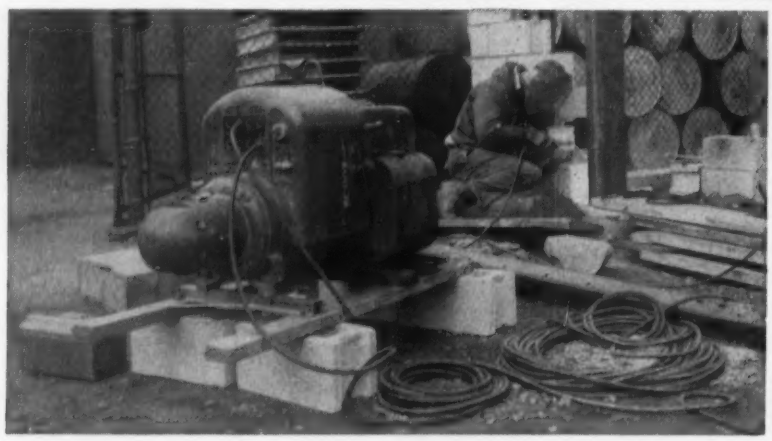
Scrubbing is required when silt and clay adhering to the surface of the material cannot be removed by a rinsing and dewatering process. The amount of scrubbing required depends on how dirty the material is and how this dirt reacts to water. In clayey materials, for instance, the clay may be readily softened, disintegrated, and carried away by the water. Again, it may be of a kind that forms balls that cannot be screened out, and so have to be broken up by some kind of abrading action.

The most common equipment for removal of clay and soft materials are (1) **the revolving scrubber** (preceding the screening process) or (2) **the log washer** (following the screening process).

Scrubbers

Some revolving scrubbers are quite simple. These consist of a cylindrical shell with lifter flights —as the shell rotates about its longitudinal axis, the material is tumbled against a flow of water. The water may be introduced with the feed or it may be brought in by pipes. Some add rinse water through sprays. Others rely on a rinsing over screens to clean out the loosened particles.

Within recent years, revolving scrubber diameters have been increased, flights have been made deeper and more numerous, and rotation has been speeded up. All this is intended to improve scrub-



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Supplies . . .

- **230 volts for heaters, heavy-duty power equipment**
- **115 volts for lights and power tools**
- **Welding current for repairs, equipment modifications and construction**

. . . all at the same time

As a Power Plant Weldanpower furnishes 4 KVA, 115/230 volts, AC, 60 cycle power.

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Weldanpower is light, compact and economical to operate.

Contractors! Write for Bulletin SB-1339

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Dept. 2715, Cleveland 17, Ohio

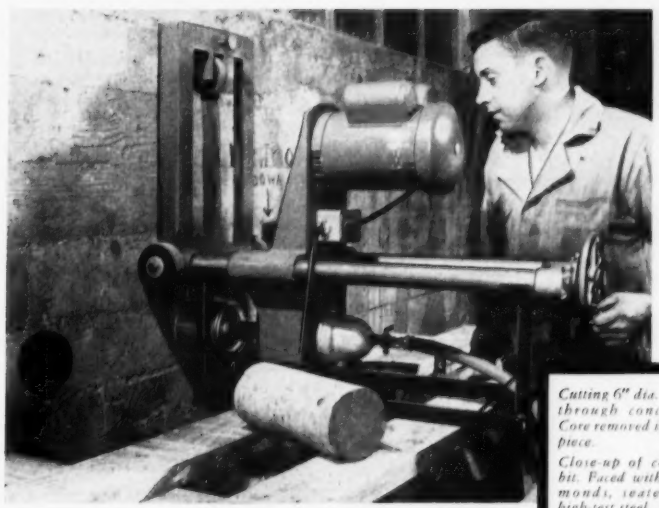
The World's Largest Manufacturer of Arc Welding Equipment

Took less than an hour to drill 12 holes through 8" concrete

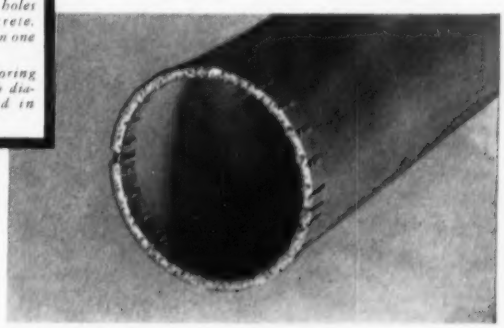
Another KOR-IT Case Example

The job, installing an awning over a 20 ft. by 40 ft. swimming pool, called for 2" pipes deep into concrete and extremely close to the pool's narrow wall. Diameter of holes had to be exactly 2", without variation all the way through. Other methods would have broken the concrete holes and pool wall, meaning an estimated 50 to 60 hours drilling. The owner's man, using a star drill, had spent 8 hours trying to drill only two of the holes. KOR-IT "cored" the 2" holes—12 of them—in less than an hour; and each core came out in a solid piece.

Every contractor needs this remarkable device for quickly cutting clean, round holes through concrete, marble, rock—almost any hard surface. KOR-IT and KOR-IT, JR. are both mobile, compact, inexpensive. KOR-IT, JR. is completely portable. Can be carried up stairways, into seemingly inaccessible places. Write today for complete illustrated information about KOR-IT precision drills and KOR-IT diamond bits. Use convenient coupon.



Cutting 6" dia. holes through concrete. Core removed in one piece.



Close-up of coring bit. Faced with diamonds, seated in high-test steel.

KOR-IT cuts round holes 1" to 8" dia. and 10" deep, plus 9" extensions as required. Two horsepower G.E. motor, 110-220 volts; or 3½ h.p. gasoline engine. Machine counterbalanced to exert correct pressure. Operates any position, vertical or horizontal. Compact, portable. Total weight 165 lbs.

KOR-IT, JR. cuts round holes $\frac{3}{16}$" to 2" dia. and 8" deep, plus 8" extensions as required. Half horsepower G.E. motor, 110-220 volts. Hand operated; works in places not accessible to other equipment. Compact, portable. Total weight 36 lbs.

CUSTOM DRILLING WITH KOR-IT
There is a great need for custom drilling. With KOR-IT equipment you'll find it profitable to service this need.

J. F. HAMLIN CO., INC., 746 Ellis St., San Francisco 9

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CUTS CLEAN, ROUND HOLES THROUGH HARD SURFACES AT HIGH SPEED

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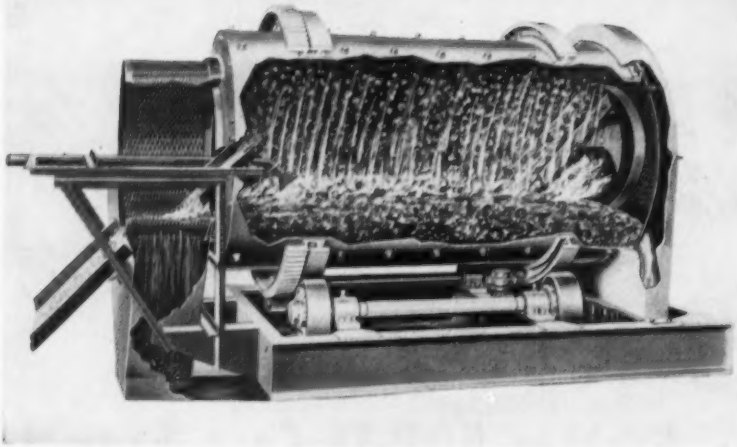

FIGURE 1.

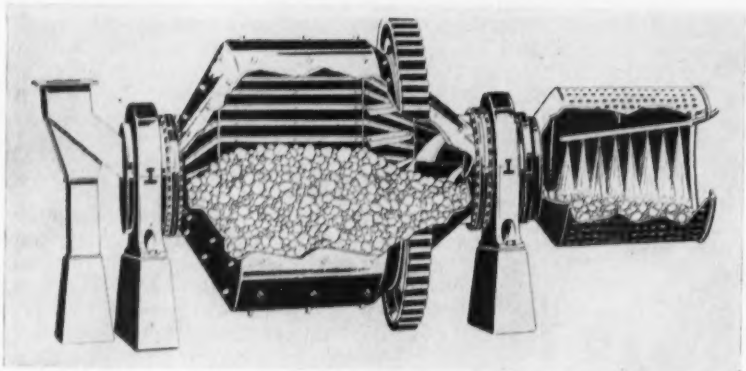

FIGURE 2. HARDINGE PHOTO

PRODUCING AGGREGATES...
continued

bing efficiency **(Fig. 1).** For sand and gravel, some scrubbers have a built-in cylindrical screen to pass sand and fines to the outer drum. This leaves the lifting flights free to churn the gravel more efficiently.

For handling crushed rock, the screen is left out. But the number of lifting flights is increased and they are staggered to increase the grinding action of rock against rock to break off loose fragments. The rate of material flow through some of these scrubbers is controlled by baffle rings that divide the scrubbing chamber into a series of compartments.

Fig. 2 shows a conical type of revolving scrubber. Stone or gravel, along with the wash water, enters the feed end. Material is tumbled and cascaded about, being thrown back by the blades in the conical end. Thus, clay balls and soft stone are disintegrated better. Dirty water carrying silt, disintegrated clay balls, and sand is discharged through the first section of the revolving screen. Clean

. . . you've a pat hand for PROFITS on any low slump concrete jobs, too

A The only truck mixer with SWING-IN HOPPER for FASTER NO FLASH-BACK CHARGING

A . . . with HOPPER THAT SWINGS OUT— permitting FAST UNOBSTRUCTED DISCHARGE of even 0" slump concrete

A LARGER DRUM DIAMETER HEAD— deeper blades for BETTER MIXING of stiff low-slump mixes

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A big share of tomorrow's business will be tied into the road building program — on jobs that call for low slump concrete.

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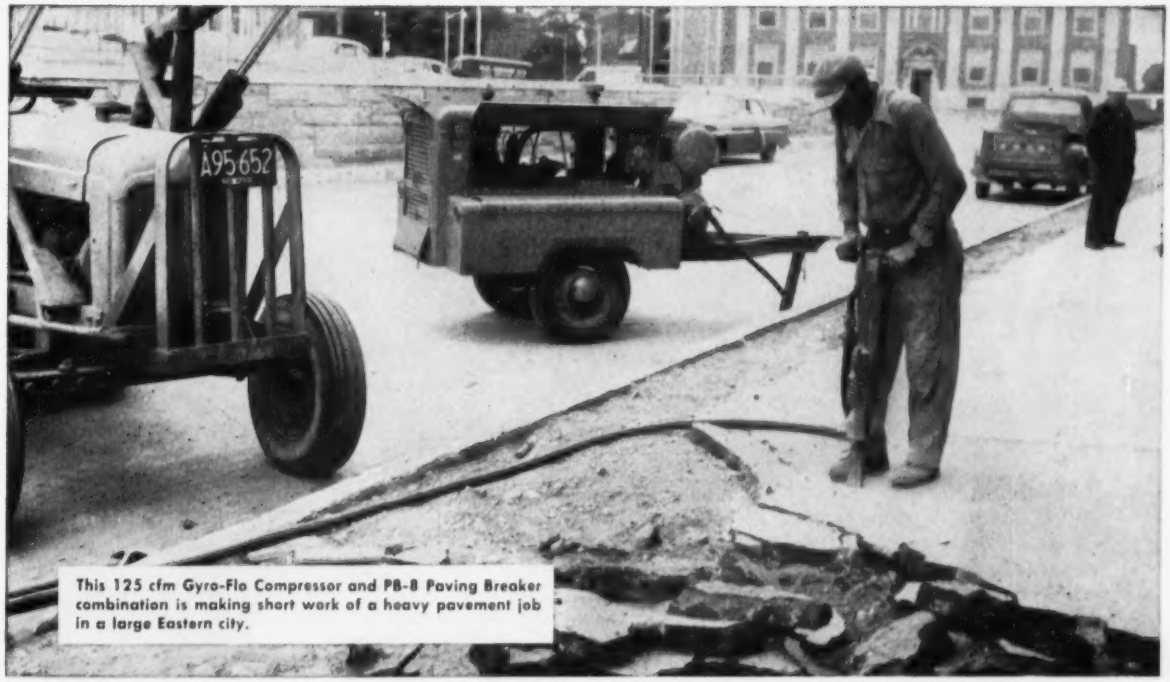

This 125 cfm Gyro-Flo Compressor and PB-8 Paving Breaker combination is making short work of a heavy pavement job in a large Eastern city.

On any pavement job, you can

BREAK IT UP and FINISH IT UP

in record time with this IR CONTRACTORS' COMBINATION

1 An I-R GYRO-FLO COMPRESSOR of the right capacity

With the complete line of Gyro-Flo rotary compressors, there's no need to haul around or pay for any more air power than you actually need. Now available in 85, 125, 210, 315, 600 and 900 cfm sizes, you can pick a unit with the *right capacity* to operate as many or as few paving breakers as the job calls for. That means no idle compressor capacity — no overloading that cuts tool pressure and slows up the work. What's more, GYRO-FLO's *proved performance* assures a smooth, dependable air supply that's tops in fuel economy and remarkably free from attention or maintenance.

2 I-R PAVING BREAKERS of the right weight and power

Ingersoll-Rand offers you the most complete line of paving breakers and accessories available today. From the big, heavy-duty, 100-lb Breaker and Pile Driver to the lightweight 20-lb Demolition Tool and Digger — you can match the *tool* to the *job*. Use only the weight and power you need — reduce operator fatigue and save air power cost. In addition, I-R paving breaker steels and accessories, designed and built to stand up longer on the toughest jobs, are available for every breaking and demolition application.

Ask your I-R representative for the complete facts on this time-saving Contractors' Combination.

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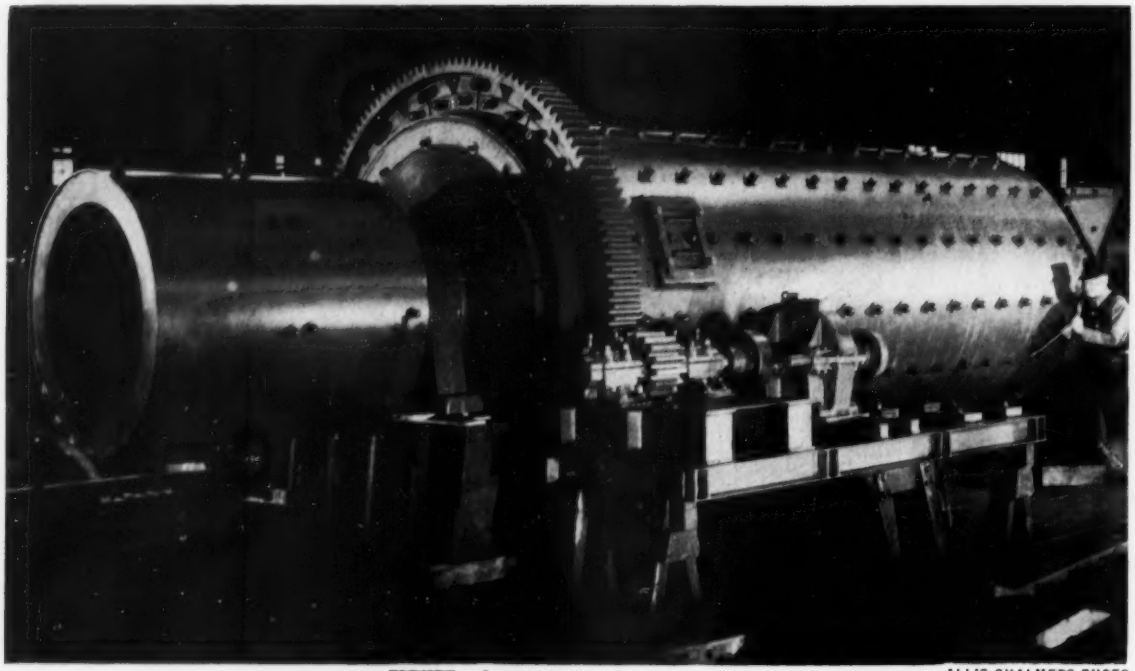

FIGURE 3. ALLIS-CHALMERS PHOTO

product is discharged out the end of the screen.

Another of the more successful types of revolving scrubbers is the blade mill, sometimes called the paddle mill. The inside periphery is equipped with adjustable paddle blades that cut through the material as it is tumbled. These mills handle up to 10-in. material **(Fig. 3)**.

Log Washers

Operating on a somewhat different principle is the log washer **(Fig. 4)**. It is particularly effective where clays are plastic, cling tightly to the surface of the rock or stone, and tend to form into balls when rolled and tumbled.

The log washer derives its name from early days when two logs with metal paddles driven into them were rotated against each other in a trough, moving wetted material from one end to the other. Today's "logs" are steel, to which are attached various forms of abrasion-resistant steel paddles. The log washer has a cutting and abrading action, with a minimum of water—enough only to "grease" the material as it moves through the machine. (The revolving scrubber requires considerably more water per ton per hour of material to do an adequate cleaning job.) The log-washer paddles slowly move the material toward the discharge opening at the upper end of the tub, while foreign material is discharged with the overflow water through a gate at the lower (feed) end. Soft soluble clay requires more water than the tough plastic insoluble type, and depth of water is controlled by the height of the discharge gate.

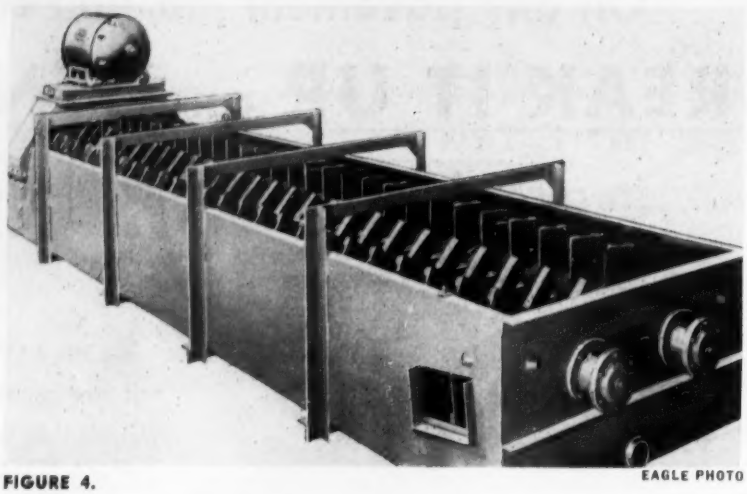

FIGURE 4. EAGLE PHOTO

To do an effective scrubbing job on dirty or clayey coarse materials, it is essential that sand and fines be removed. When using a log washer, this is done first by screening. With a revolving scrubber, it may be done as described above, where a cylindrical screen is housed inside the scrubber. Or it may be handled by making the water flow counter to the flow of material so that the fines are washed out through a perforated plate at the feed end of the drum.

Generally, a revolving scrubber is installed so that it slopes downward from the feed end. The log washer is installed so that it slopes upward from the feed end. Normal slope is about 8 deg, with a 5-deg minimum and a 10-deg maximum.

Whether to use a revolving scrubber or a log washer is controversial. Both may have to be followed by rinsing at some stage of processing the coarse material to make it really clean. In ordinary clays that tend to dissolve in wa-

continued on page 247

with Hydraulic Load-Shock-Absorber

a PAYLOADER® DELIVERS MORE!

LESS SPILLAGE means MORE YARDAGE

It's the yardage you *deliver* that counts — not how much you *dig*. The difference is the spillage that occurs between digging and dumping points — the amount you handle for nothing.

"PAYLOADER" tractor-shovels are designed to *deliver* more yardage — to dig big loads and to move them with the least spillage loss — because "PAYLOADER" and only "PAYLOADER" among wheeled tractor-shovels has hydraulic load-shock-absorber as standard equipment — that cushions the loaded bucket, eliminates bucket jounce, smooths the ride, and permits higher carrying speeds with less spillage. Other "PAYLOADER" design features that reduce spillage losses are the longer wheelbase and the low, close and stable load-carry position with bucket in full 40° tip-back just off the ground.

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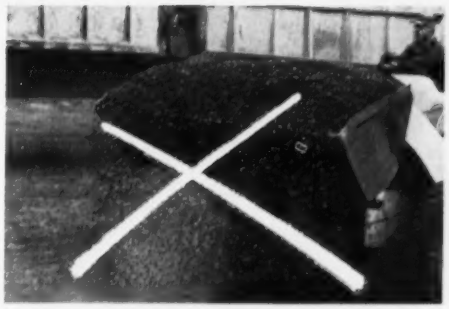

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Reo tandems chute concrete directly into tremies while pouring a 2710 cu. yd. seal for bridge pier in Portland, Ore. A Seattle construction and engineering co. completed the pour in 20 hours, averaging 135 cu. yds. an hour.

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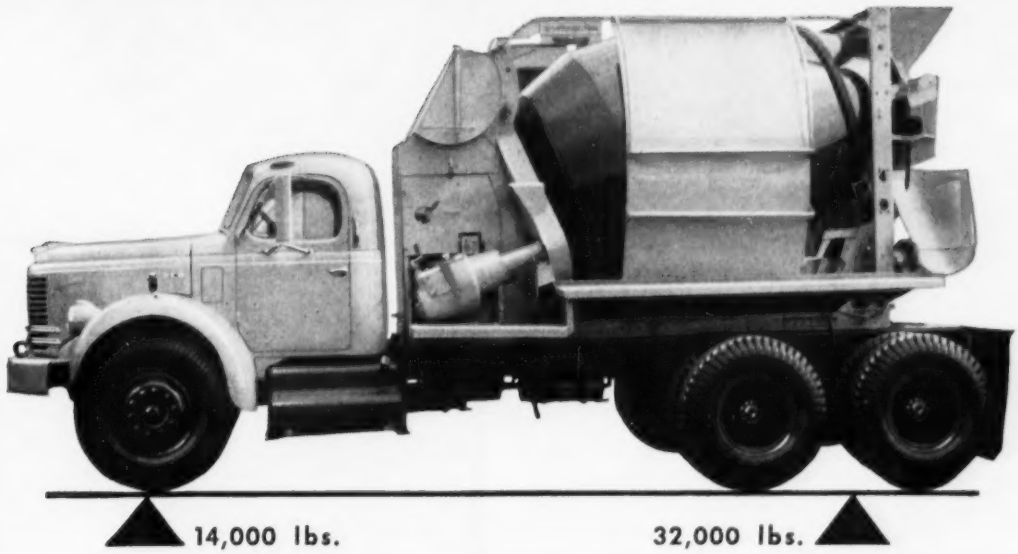
MORE MIX

6½ yds. within 32,000 lb. tandem limit



If you want to haul more mix at lower cost—LOOK AT REO! The new Reo F-506M is designed and built specifically for mixer use. The F-506M hauls bigger payloads because it has new high-strength, low weight double-side-rail frame construction and *"payload-engineered" weight distribution.* And because Reo is tough —real tough all the way through.

The new Reo F-506M actually hauls up to 2 yards more than the average mixer chassis. And it places as much as 6,000 pounds more on the front axle than other conventional mixer trucks. Additional hundreds of pounds can be added to the carrying capacity of the new Reo F-506M with Reo's optional front-end power take-offs. The PTO also eliminates extra fuel and maintenance costs of the mixer's auxiliary power unit.

With Reo, you can haul your regular daily volume with fewer trucks and drivers . . . or increase daily volume without increasing your fleet.

Reo full power steering, which is standard, makes maneuvering easy in tight places anywhere.

The new F-506M is powered by Reo's own 170 hp short-stroke, wet-sleeve Gold Comet engine. Plenty of power for both truck and mixer. And you get Reo's famous *100,000 mile or one year engine warranty.*

For states that permit greater axle loadings than 32,000 lbs., Reo builds the F-536M—52,000 lbs. G.V.W. Thirty-three other models, including eight off-highway units, means a Reo truck ideally suited for any construction job.

Seeing is believing. Call your Reo branch or distributor today and ask for a demonstration on your job or write for free folder.

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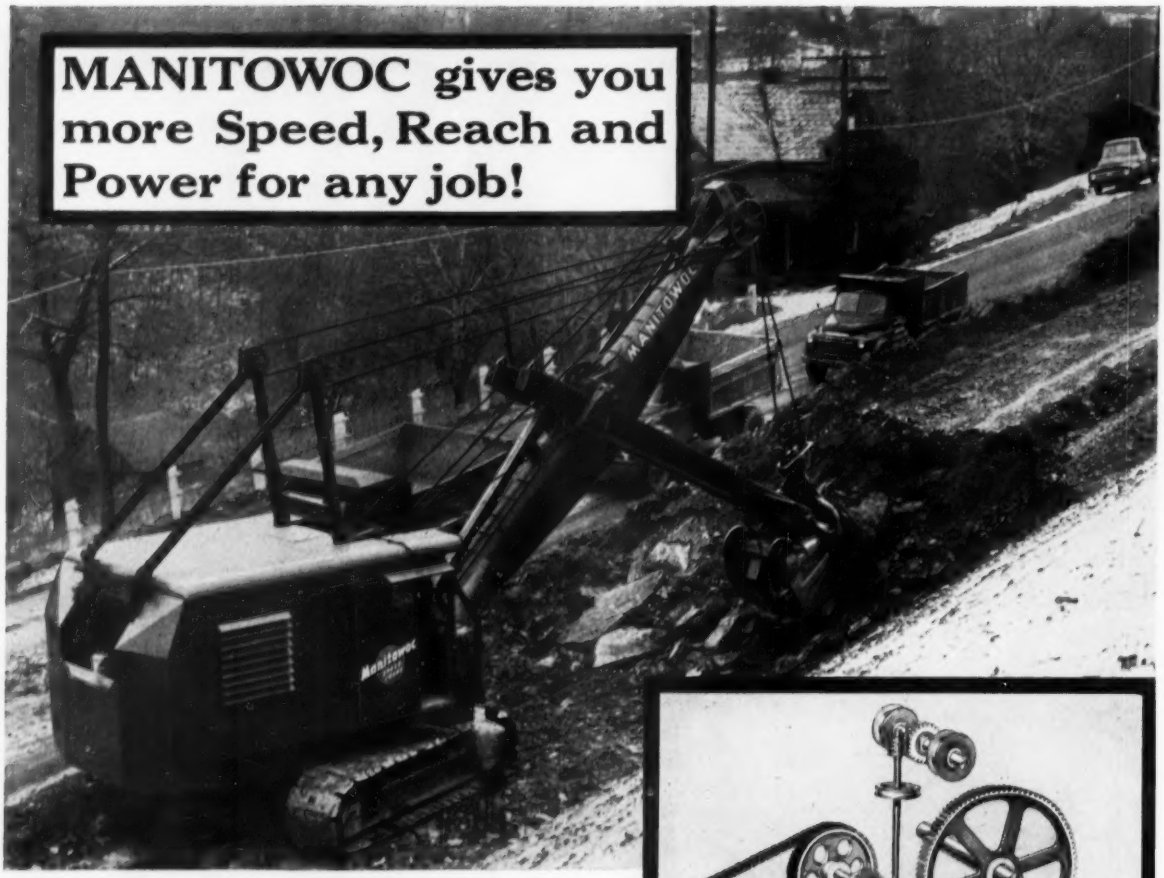
WORLD'S TOUGHEST TRUCK

MANITOWOC gives you more Speed, Reach and Power for any job!



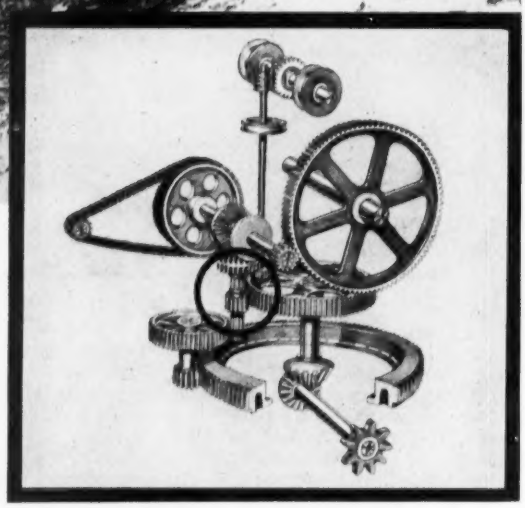
Successful contractors base their bids on a Manitowoc's ability to produce big yardage output — in less time — at lower cost. For instance, R. J. Nichols of New Bethlehem, Pa. uses a Manitowoc 2-yd. Model 3000 shovel to tackle a $1,134,000 highway job for the State of Pennsylvania. The work involves widening a 10 mile, 2-lane highway 4' on each side and eliminating dangerous curves. An estimated 165,000 yards will be excavated before the job is completed. As a long-time user of Manitowoc equipment, Mr. Nichols, like many other prominent contractors, knows he can depend on his shovel to deliver more speed, reach and power to finish the contract on time — at a profit.

More "LOW-BID" Features

Simple Crawler Drive has positive, jaw-type steering — extremely maneuverable in tight quarters. **Completely Enclosed** travel gears and clutches keep going longer with less downtime. **Simple, Accessible Main Machinery** makes full use of power — is easy to get at for convenient servicing. **Dependable, Disc Type Clutches** are easily adjusted, with discs replaceable in minutes. **Smooth-Acting Air Controls** are available to keep your shovel runner at top operating efficiency the entire shift. **Self-Removing Counterweight** is available for fast, simple moves between jobs within highway load restrictions.

Bid more profitable jobs with Manitowoc — check the finest first, then decide!

Manitowoc Engineering Corp., Manitowoc, Wis.



Simple Design . . . Direct Power Flow

EXCLUSIVE SLIDING PINION arrangement (circle) makes use of only one set of clutches for travel, swing and boom hoist. Only working gears turn — all others are disconnected — for full power at the dipper.

ONLY 3 MAIN SHAFTS cross the rotating bed.

FEWER GEARS AND PINIONS — only 17 are needed in the Model 3000.

GREATER ACCESSIBILITY reduces downtime for maintenance and servicing.

SEE YOUR DISTRIBUTOR NOW!

MANITOWOC

SHOVELS 1-5½ YD. Speed Crane CRANES 20-100 TON

ter, or for breaking up loosely formed conglomerates and soft stone, the scrubber and the log washer may be considered equally effective. In the more tightly formed conglomerates and in plastic clay tending to ball, the nod has to go to the log washer. That's largely because of its more positive abrading and cutting action.

Coarse Material Screw Washers

In many cases, neither revolving scrubber nor log washer is required to clean the coarse aggregate. It often is quite feasible to remove the deleterious matter (including shale, wood, coal, and trash) with a coarse material screw. Both single- and double-screw washer-dewaterers are available, and the choice depends largely on capacity required. Some coarse material screws have provision for paddles at the lower end to aid further in abrading the dirtier materials.

The coarse screw washer **(Fig. 5)** has a long vertical-sided tub in which a screw turns. Material is fed in at the lower end, and the screw gradually works it up through the water to the discharge end. There is a length of the tub above the water where dewatering takes place.

Coarse material washers are equipped with an adjustable tub

FIGURE 5. EAGLE PHOTO

SPECIFICATIONS — REVOLVING SCRUBBERS

Diameter of Scrubber (inches)	60		72		84		96	
Type of Scrubber	Sand	Gravel	Sand	Gravel	Sand	Gravel	Sand	Gravel
Length of scrubber cylinder, feet	9	9	10½	10½	12	12	14	14
Weight, complete scrubber empty with countershaft but no pulley, lbs., about	13500	14000	22000	22500	32000	33000	49000	51500
Weight, full of aggregate and water, lbs., about	16960	17500	27800	28300	41000	42000	63500	65700
Cubical contents, cubic feet, about	600	650	985	1050	1480	1600	2275	2450
Speed of drum, R.P.M.	30	30	27	27	25	25	23	23
Horsepower required, high torque, squirrel cage electric motor	40	40	60	60	100	100	125	125
Capacity per hour, tons, about	35-70	35-70	60-120	60-120	95-180	95-180	120-240	120-240
Maximum size of feed advisable, inches	3	3	4½	4½	6	6	8	8
Water required, G.P.M., about	200-300	200-300	350-550	350-550	550-850	550-850	700-1100	700-1100

TABLE 1.

TABLE 2.

SPECIFICATIONS—PADDLE TYPE LOG WASHERS

Log Diameter	36"	36"	36"	48"	48"
Tub Width	7'-0"	7'-0"	7'-0"	9'-4"	9'-4"
Tub Length—Feet	20'	24'	30'	24'	30'
Max. Capacity—tons per hour (Depends on Material size and the amount of foreign material to remove)	85	85	85	150	150
Maximum Material Size (see page 35)	4"	4"	4"	8"	8"
Horse Power Req. (Electric) at normal speed	60	75	100	125	150
Water Required (G.P.M. at 25 P.S.I.)	50-500	50-500	50-500	50-700	50-700
Weight of Washer—Pounds	31550	33850	37200	54400	62300

SPECIFICATIONS — SINGLE SCREW COARSE MATERIAL WASHER-DEWATERER

Screw Dia.	18"	20"	22"	22"	24"	24"	30"	36"
Tub Length—Feet	15	15	15	18	15	18	18	18
Capacity—Tons per hour	30 to 40	35 to 50	45 to 60	45 to 60	65 to 80	65 to 80	100 to 125	175 to 200
Max. Mat'l. Size	2"	2"	2"	2"	2"	2"	2½"	2½"
Horse Power Req. (Electric)	7½	10	10	10	15	15	20	30
Water Req. (G.P.M. at 25 P.S.I.)	200 to 300	200 to 300	250 to 350	250 to 350	300 to 400	300 to 400	350 to 450	400 to 600
Screw Speed R.P.M.	50	45	40	40	40	40	35	32
Weight of Washer—Pounds	4700	5100	5500	6300	5900	6800	8900	10700

TABLE 3.

SPECIFICATIONS — DOUBLE SCREW COARSE MATERIAL WASHER-DEWATERER

Screw Diameter	30"	36"
Tub Length	18	18
Capacity — Tons per hour	200 to 250	300 to 350
Max. Material size	2½"	2½"
Horse Power Req. (Electric)	40	50
Water Req. (G. P. M. at 25 P. S. I.)	600 to 800	700 to 900
Screw Speed — R.P.M.	35	32
Weight — Pounds	15000	17100

TABLE 4.

Flow of Water Thru Plain Pipe Nozzles in Gallons Per Minute

Water Pressure (Pounds)	NOZZLE SIZE			
	¼"	5/16"	⅜"	7/16"
20	5.1	7.9	11.4	15.5
30	6.2	9.7	14.0	19.0
40	7.2	11.2	16.1	21.9
50	8.0	12.5	18.0	24.6
60	8.8	13.8	19.7	26.9
70	9.5	14.8	21.3	29.0
80	10.1	15.8	22.8	31.0
90	10.7	16.8	24.2	32.9
100	11.4	17.7	25.5	34.8
110	11.9	18.6	26.7	36.4
120	12.4	19.4	27.9	38.0
130	12.9	20.2	29.0	39.5

TABLE 5.

end plate. For processing the larger sizes of aggregates, this plate should be set at the lowest position, or be removed. By raising the end plate and feeding the material farther up the tub, and reducing the volume of wash water, the smaller sizes of coarse materials can be washed. Thus it is apparent that when there is a wide range between the top and bottom sizes in the coarse material, it becomes necessary to use more than one coarse screw and to make a size split in the feed to each. Maximum size feed to a coarse screw washer is approximately 2½ in. Thus a good split might be 2½ to 1 in. and 1 to ½ in. (or ⅜ in.); another might be 2½ to 1¼ in., 1¼ to ¾ in., ¾ to ⅜ in. depending on the sizes required.

Tables I through IV give specifications and operating data for typical scrubbers and washers. These vary according to manufacturer and are listed here only as a guide. All manufacturers are glad to furnish their own data and specifications upon request.

Removing Shale and Trash

The screw type coarse material washer can be equipped with a tub end designed to remove shale and similar material. The shale remover seals off the bottom of the tub end, forcing overflow water into a rising column of considerable velocity through an opening formed by a pair of hinged baffle plates. Material is fed onto an incline so that it is met by the column of rising water. This floats out the shale, while the good material enters the tub. It is important, when removing shale, that the feed material be graded and a separate washer be used for each size. That's because the small differences in specific gravity between good stone and shale require exacting adjustments to the shale remover.

It should be emphasized that if the minus No. 8 crushed material also contains shale particles, it is almost impossible to remove them with ordinary washing and classifying equipment and still retain the finer mesh sands (100 and 200 mesh) required in, say, mortar sand or plaster sand. For this reason it may be necessary to manufacture sand from some of the coarser aggregate from which the shale has been removed. Caution here too is required because 100% elimination of shale, even from the coarser material, is virtually impossible by any economical method.

The coarse material washer of the screw type is also available with a tub and designed to remove trash more easily floated than shale. It consists simply of an inclined plate up which the trash is rolled by the overflow water.

To keep the shale, trash, and other larger sized foreign matter out of the waste flume, a piece of woven wire cloth can be fashioned to form a strainer. This is emptied as necessary.

The safest way to determine the probable effect of washing material is to test a representative sample. Accredited testing laboratories do this for a fee. Or, as already indicated, most manufacturers of washing equipment will test the samples prior to making equipment recommendations.

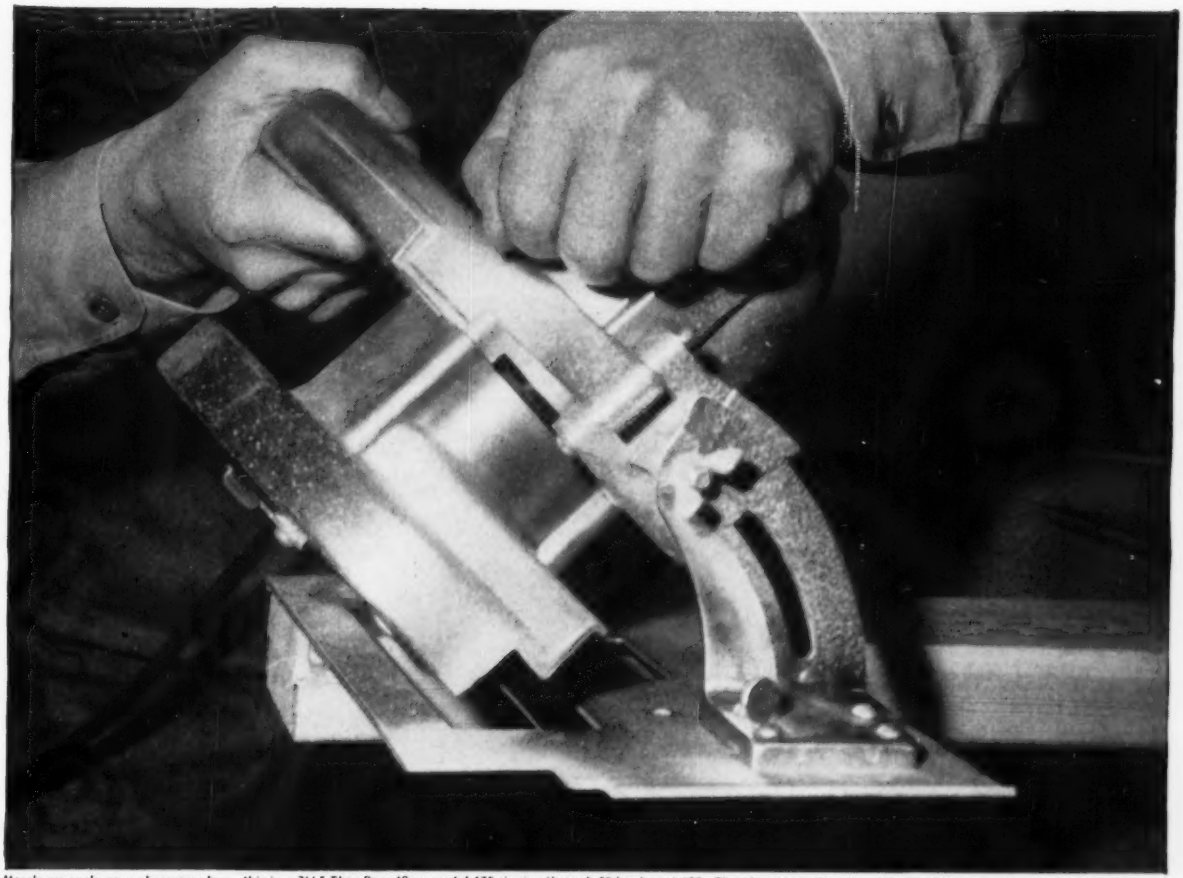
Handling of Fines

Fines (material from ¼ in. down to 200 mesh, and smaller) require a different treatment than coarse materials for washing, classifying, and dewatering. However, fines cannot be ignored when processing the coarse material. So, in the following examples of typical washing plant layouts, equipment for handling the fines will be mentioned, but details will be covered later.

Types of Washing Plants

Like crushing and screening

continued on page 251



Here's an angle on a sharp saw buy—this is a 7¼" Thor SpeedSaw model 475 zipping through 2" lumber at 45°. There's nothing like it on the market for anywhere near its $64.95 price.

Cut your lumber and your costs faster!

Choose from 7 powerful Thor saws

Get Thor electric saws on the job. Save costly labor time—keep the crew happy, power saws are a lot easier on the operator than hand methods. Build up your profits per job—get the crew to the next job quicker.

And look at the selection of tools Thor's got for you. Seven saws ranging from the 6¼" Thor Model 450 SpeedSaw (Just $49.95, cuts 2 x 4 at 45°) to the brawny Thor Silver Line T-12 with a 12" blade, capable of a 4⅞" cut. Other Thor saws include the popular Thor Model 475 7¼" SpeedSaw with a 1.75 h.p. motor at $64.95, 6¼" Silver Line model T6, 7¼" Model T7, 8¼" model T8 and 10" Model T10.

All Thor SpeedSaws and Silver Line saws are available with combination blade, 10 ft. of 3-conductor cable, nut wrench, lubricant and steel carrying case. 9 blade types and a variety of abrasive discs are offered as accessories.

Thousands of Thor saws are on building sites right now saving time and money. Why don't you ask your Thor distributor to demonstrate any Thor saw right on your site? Thor Power Tool Co., Prudential Plaza, Chicago 1, Illinois.

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PORTABLE POWER
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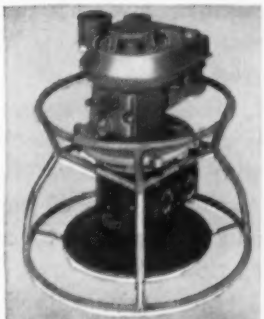

Need power on the job site?

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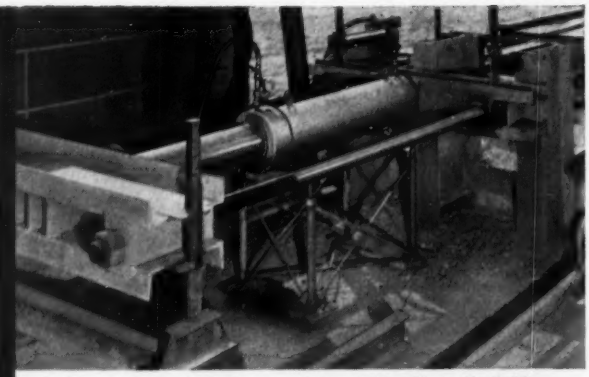
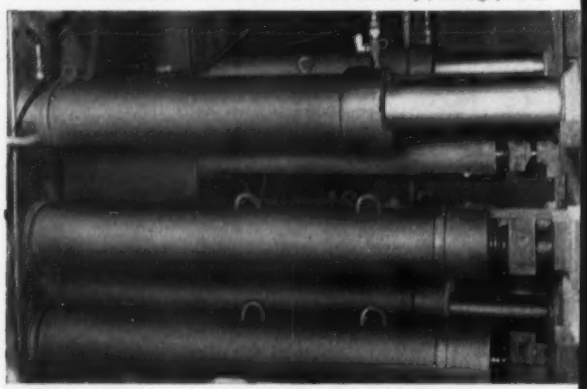
Branches in all principal cities

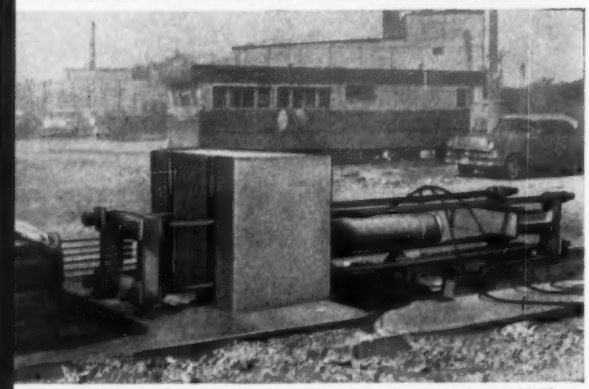
NORTH CAROLINA—North Carolina Products Corp., Raleigh, N. C.



CALIFORNIA—Rockwin Prestress Concrete Co., Norwalk, Calif.



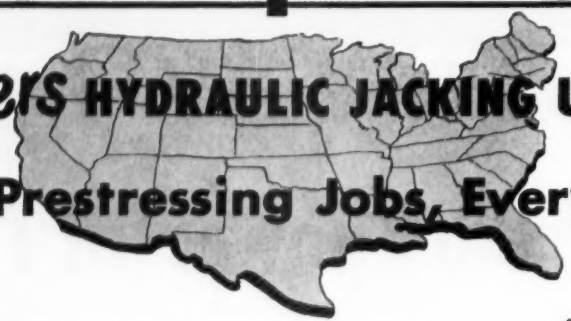
PENNSYLVANIA—Schuylkill Products, Inc., Cressona, Pa.



NEW YORK—Frontier Dolomite Concrete Products, Lockport, N. Y.

Rodgers HYDRAULIC JACKING UNITS

Best On Prestressing Jobs, Everywhere!



RODGERS Hydraulic Jacking Units used singly or in multiples of two, four or more provide "controlled pretensioning and detensioning" of steel strands.

Regardless of size or type of bed design—whether the jacking carriage is of rods with locking nuts or guided structural steel abutments with locking screws—Rodgers Jacks assure smooth, positive action. Accurate control of pump and jacks provides uniform pretensioning and detensioning to conform with exacting state and municipal specifications.

Prestressing units with any number of jacks are available with hand operated or power driven hydraulic pumps in capacities from 50 to 600 tons. Double-acting jacks are offered with ram travels of 30 or 48 inches. Single-acting jacks with ram travels of 6, 7½ or 13 inches.

For complete information on Prestressing Jacks and Pumps write for Rodgers Catalog 332

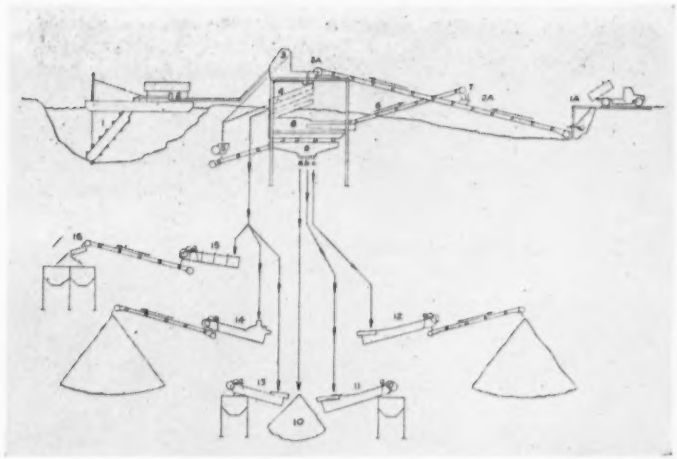
HI-PRESSURE Rodgers HYDRAULICS

Rodgers Hydraulic Inc.

7403 Walker Street • Minneapolis 26, Minnesota

EXPORT DIVISION
205 WEST WACKER DRIVE
CHICAGO 6, ILLINOIS, U. S. A.

FIGURE 6.



EAGLE PHOTO

Flow Diagram

WET OPERATION

1. Dredging Ladder—An auxiliary tool to plain suction. It assures a continuous uniform flow of solids by agitating and loosening deposit and by keeping oversize and debris clear of nozzle to prevent clogging or damaging of suction line and pump.

2. Dredge—Complete with power, drives, hydraulic dredging pump, ladder hoist, A-frame, and deck house.

3. Pump Box—Usually contains a grizzly screen for scalping off oversize stone, sticks, or other undesirable material. It also operates as a velocity retarder and hopper to insure a uniform feed of material to screen (4).

DRY OPERATION

1A. Truck Hopper-Feeder — Truck dump is one of several ways of delivering material to conveyor belt.

2A. Belt Conveyor.

3A. Collecting Hopper.

WET OR DRY OPERATION

4. Three-Deck Vibrating Screen — Equipped with a pan for delivering material through the bottom deck to the feed end of water scalping tank (8).

5. Crusher—Reduces material from top deck screen (4) and/or from the grizzly (3).

6. Return Conveyor—Carries material from crusher back in closed circuit. In a pumping operation this return might be a bucket elevator in closed circuit with screen (4).

7. Transfer Hopper.

8. Water Scalping Tank—Receives all fine material and water passing the bottom deck of screen (4). Equipped with velocity killer, it permits sand to settle out of surplus water either developed in washing or delivered to screen by dredge.

9. Multiple Collecting-Blending Flume —In this case, a "triple". Has three compartments receiving three gradations of sand selected from the various adjustable bleed valves in the bottom of tank (8). Discharge port (a) permits stockpiling at 10, from the waste compartment from any valve, the percentage of sand gradation in the deposit in excess of specifications. Port b delivers a blended coarse sand, while c delivers a blended fine sand. Three gradations of sand can be produced where waste is not required.

10. Stockpile — Possible secondary market material from waste compartment by chute. Wet sand from port a.

11. Fine Material Screw Unit—For final washing-classifying and dewatering of coarse sand gradation from port b.

12. Fine Material Screw Unit—Same as 11 except used on fine sand gradation from port c.

13. Coarse Material Washer-Dewaterer.

14. Coarse Material Washer-Dewaterer—Fitted with either auxiliary shale or coal remover, or trash remover tub end.

15. Log Washer—For thorough cleaning and scrubbing of such hard to handle coarse material as cemented aggregates, tough insoluble clays, conglomerates, and soft stone. Units 13, 14, and 15 may be used in any of several combinations, depending upon the deposit and the specifications to be met.

16. Sizing Screen—permits a split of two gradations of material. In this case it screens the product from the log washer into two sizes.

PRODUCING AGGREGATES . . .
continued

plants, washing plants are of three general types:

Stationary
Semi-portable
Portable

The stationary plant is installed for long-time use at one site to serve a specific market area. It may not differ greatly from a semi-portable plant in size and type of units, but the arrangement and installation will be of a permanent nature.

The semi-portable plant usually is arranged with units grouped and combined for ready and quick dismantling for moving. Transport generally is by truck and trailer, although sometimes axles and wheels can be attached to the units themselves for hauling.

The portable washing plant, less common than the portable crushing plant, is equipped with wheels for easy moving. As more job-site washed aggegates are required on construction jobs, the portable washing plant probably will increase in popularity and application. Manufacturers are aware of this, and already have taken steps to "mobilize" all the essential units of even the more complex washing plant setups.

A portable plant frequently cannot be justified unless adequate water can be made available without too many pumping, piping, and waste disposal problems. Otherwise there is nothing to be gained by having the plant itself on wheels and rubber. Economy in these cases dictates the use of a semi-portable plant, well unitized, to simplify moving. But the washing plant will not be moved any oftener than necessary to maintain over-all efficiency of the whole aggregates supply operations.

Stationary & Semi-Portable Plants

Because stationary and semi-portable plants are similar in general design and application, a discussion of one will suffice for the other. (Actually, the only difference is that the stationary plant generally has auxiliaries selected for more permanent location.) And it will be assumed that the material, before being fed to the washing plant, either has been crushed and screened to size or is produced from a raw supply requiring no pre-crushing. If the latter, the initial operation may be wet or dry

FIGURE 7. PIONEER PHOTO

PRODUCING AGGREGATES...
continued

depending on whether the raw supply is taken from below ground water level or above it.

Perhaps the simplest way to show the relationships of probable units of equipment is to refer to **Fig. 6.** It is a representative flow chart showing the types of units that might be involved in a washing plant setup and indicates where

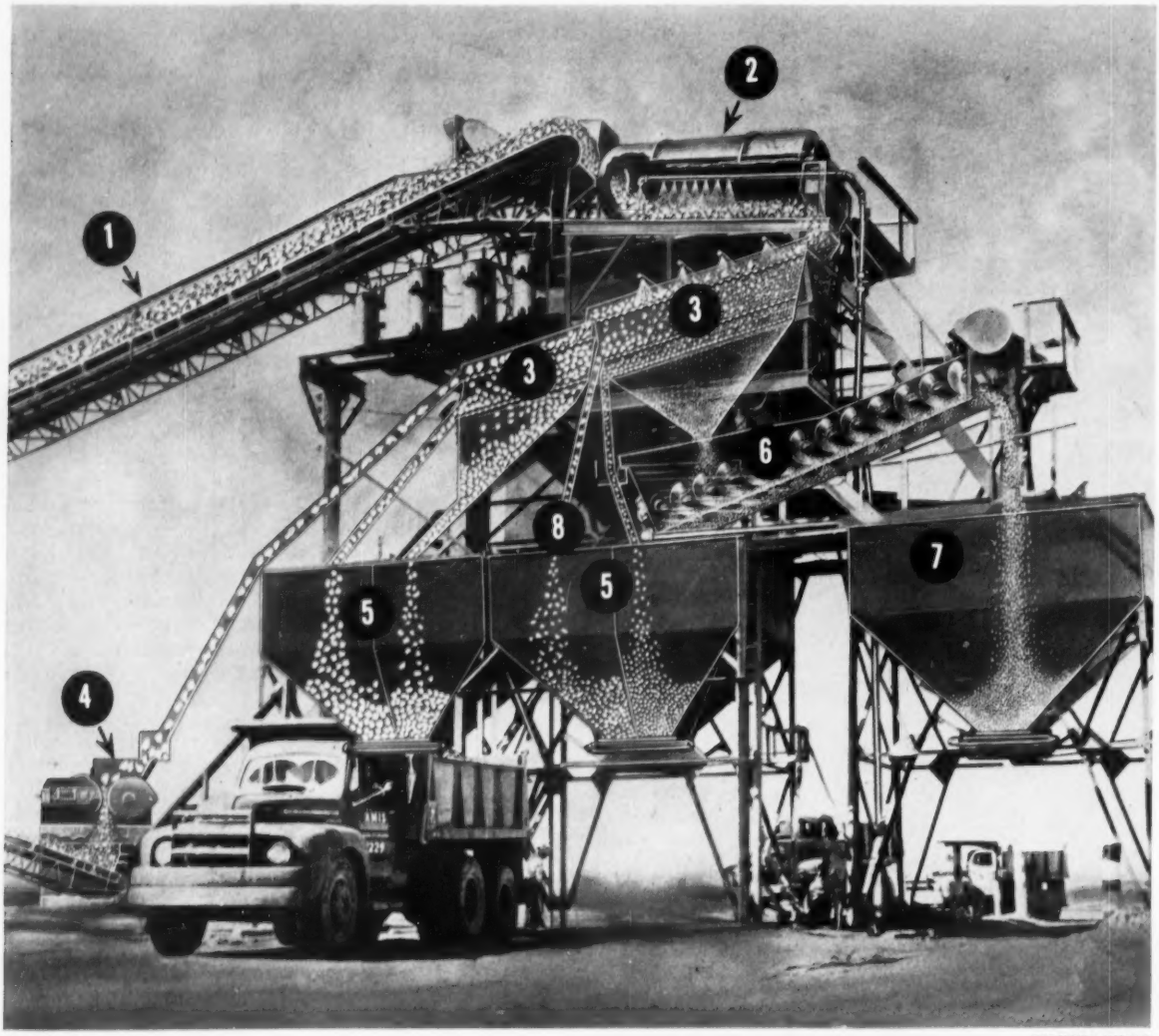


FIGURE 8 PIONEER PHOTO

WASHING SEQUENCE—Pit-run material is loaded into mechanical feeder (not shown) that empties onto conveyor **(1)** for elevating to 72-in. x 12-ft revolving scrubber **(2).** After being thoroughly scrubbed, sand and gravel pass to 4x20-ft. tandem vibrating screen **(3)** where they are rinsed and sized. Oversize requiring further processing is chuted to roll crusher **(4)** where it is reduced and fed back into the raw material by a return conveyor and transfer system. Sized gravel is passed by chute into bins **(5)** for storage and loading, while sand is spouted to twin-screw dehydrator **(6).** Here dirt is removed and sand dumped directly to storage bin **(7)** or moved by conveyor to a stockpile. Dirty water is flumed off **(8)** to a settling pond.

If a second size of sand (plaster or mason's sand) is desired, it can be produced by either of three methods: (A) Adding a water scalping tank and second dehydrator, (B) Inserting a 3-ft long section of No. 8 screen in the front part of the bottom deck of the 4x12-ft vibrating screen and chuting the passing sand directly to a second dehydrator, or (C) Changing the screen in the bottom deck of the 4x12-ft vibrating screen from a No. 4 to a No. 8, running the desired amount of mason sand and then changing back to a No. 4 screen. The minus 4 to plus 8 mesh sand will carry over into the next larger size material while the minus 8 mesh is being produced.

33% Longer Wear with VHS Shovel Hoist Ropes

Lester Van Alystyane, Superintendent of The Callanan Road Improvement Company, Kingston, New York says: "Quarrying operations are rough on shovel hoist ropes. The best Improved Plow Steel shovel hoist ropes we could buy for our 120-B Bucyrus-Erie shovel used to last for about 250 thousand tons of rock. When we switched to new **TRU-LAY VHS** the life of our ropes jumped over one-third—now we get 325 to 350 thousand tons per rope.

"The new **VHS** seems to take the shocks better than any other rope we have used. And it saves us money on 'down time' and loss of production."

New **VHS** is setting new records like this in hundreds of applications—as shovel hoist ropes, scraper and dozer cables and draglines. Made from a new grade of steel for wire rope, it is at least 15% stronger than IPS—the strongest grade formerly available.

Handle Heavier Loads—With Higher Safety Factor

This extra strength means you can safely handle heavier loads with the same diameter line. And you get a higher factor of safety during the entire period of operation.

Tougher

And, in addition to its greater strength, new **TRU-LAY VHS** is tougher. It was developed especially for the toughest applications—draglines, shovel hoist ropes, scraper and dozer cables. It thrives under the abuse wire rope necessarily gets in these punishing services.

Cuts "Down Time"—Lowers Cost

Because it is stronger and tougher, new **VHS** lasts longer in these tough applications. This saves money. And you make additional savings by reducing the amount of "down time" necessary for wire rope replacement.

Your American Cable distributor has draglines, shovel hoist ropes and scraper and dozer cables of new **TRU-LAY VHS** in stock now. You don't need any complicated specifications to order them. Just call him today and tell him the size and diameter you want.

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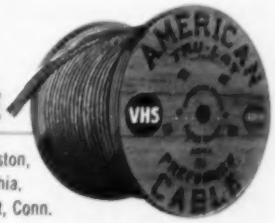
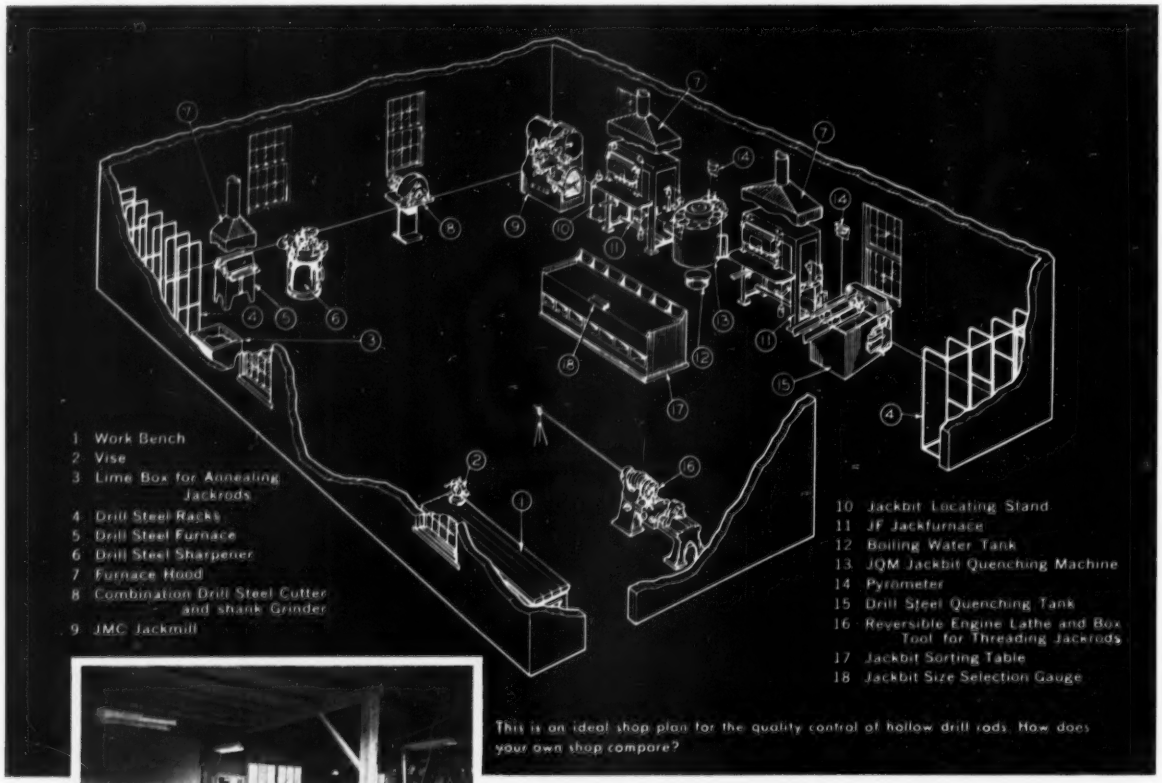


how to get the most out of HOLLOW DRILL RODS


1 Work Bench
2 Vise
3 Lime Box for Annealing Jackrods
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6 Drill Steel Sharpener
7 Furnace Hood
8 Combination Drill Steel Cutter and Shank Grinder
9 JMC Jackmill
10 Jackbit Locating Stand
11 JF Jackfurnace
12 Boiling Water Tank
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16 Reversible Engine Lathe and Box Tool for Threading Jackrods
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18 Jackbit Size Selection Gauge

This is an ideal shop plan for the quality control of hollow drill rods. How does your own shop compare?

Typical on the job arrangement.

To bring you the best drill rods possible, manufacturers spend many thousands of dollars each year in development and testing. Crucible, for example, put more than half a hundred different alloys through their paces before CA DOUBLE DIAMOND and 4E Alloy Hollow Drill Rods proved the answer to lower cost drilling.

But to get the most out of modern drill steels, you've got to *maintain* their fine quality *after they reach your shop.*

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Unintentional abuse of drill steel by improper forging, machining, heat treating and other shop operations, produces a rod that is bound to give poor performance.

That's why full time supervision on operations such as these can mean longer drill life on the job:

1. Check heat treating process. Overlap heats for proper time.
2. Check furnace and forging temperatures.
3. Check annealing process to insure correct hardness.
4. Check Rockwell hardness of shanks and thread ends.
5. Check fit of bits on newly threaded rods.
6. Check location and severity of metallurgical notch.
7. Examine all rods returned from the job and determine reason for failure.

Shop control of this type actually saves money by eliminating many rod failures on the job. Personnel will be enthusiastic in reporting improved rod performance, and you'll be getting lower cost per foot of hole drilled.

Your nearby Crucible representative will be glad to supply helpful information on other phases of drill rod care and operation — or arrange for *prompt* deliveries of hollow drill rods in the sizes, grades, and types you need. *Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

CRUCIBLE first name in special purpose steels

Crucible Steel Company of America

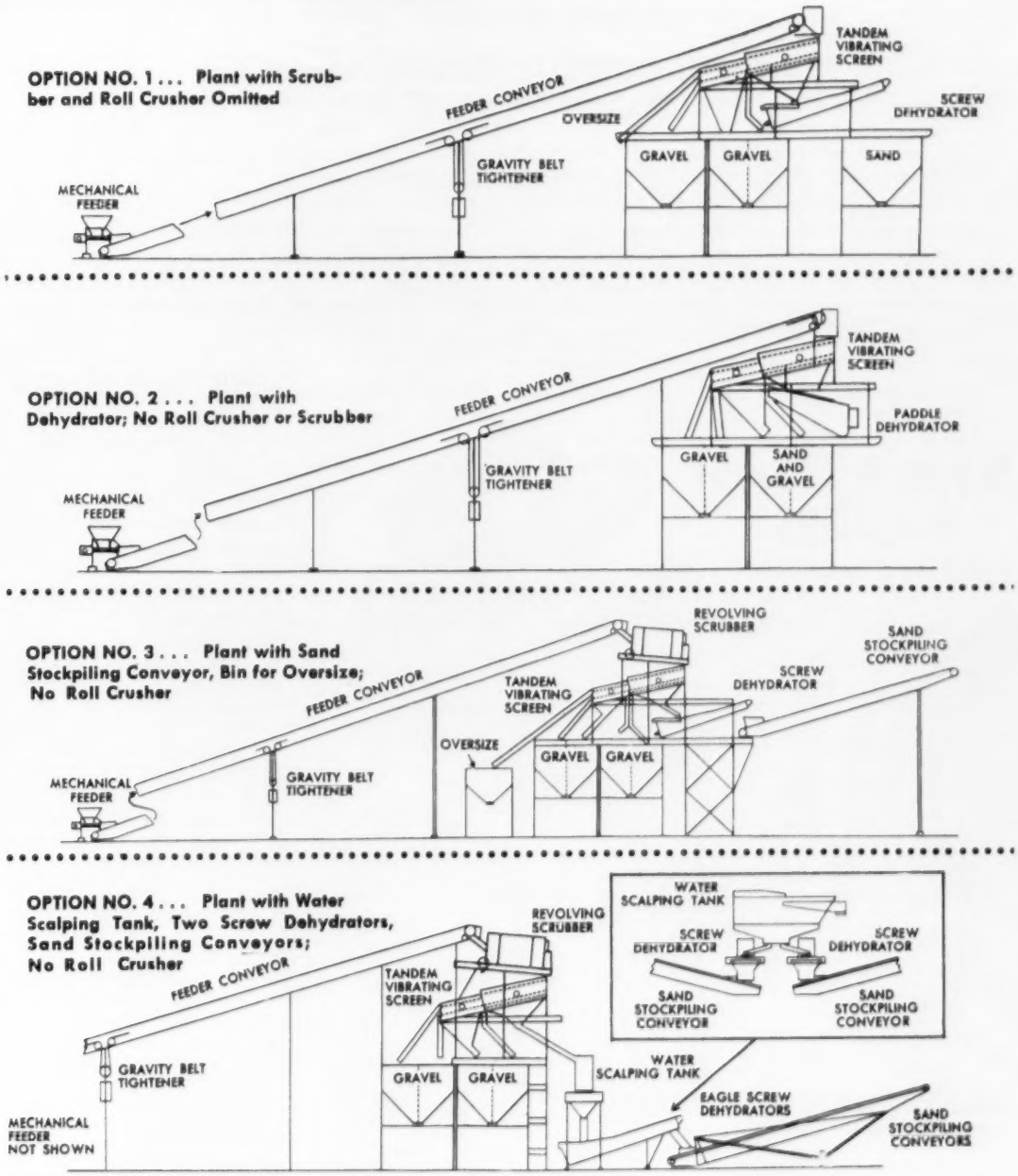

FIGURE 9.

and how, in the flow of materials, these units would be utilized to perform their various functions. For those who prefer, a revolving scrubber can be used ahead of the vibrating screen, in which case the log washer would be replaced by a coarse screw.

Fig. 7 shows a simple washing and screening plant of approximately 50 tph capacity. It does a satisfactory job where materials are not excessively dirty, where clays are readily soluble, and where there is a minimum of such things as conglomerates and soft stone. The flow of material and water are readily apparent. While a sand drag is shown, a fine material screw can be used instead. Its use would increase the sand capacity and provide better control over retention of fines in the smaller sizes. Water use in such plant likely will not exceed 700 gpm.

A higher capacity plant of approximately 150 tph, is shown in **Fig. 8.** This plant has a revolving scrubber ahead of a vibrating screen. A tandem type screen (with three decks on the upper screen and two decks on the lower) provides adequate deck surface for separation into four sizes plus an oversize and sand. As shown, the oversize is crushed and returned for sizing. A plant of this type needs between 1,000 and 2,000 gpm of water, depending on the dirtiness of the material and the requirements for sand classifying.

Fig. 9 shows various options possible for operation of a plant of this general design.

continued on next page

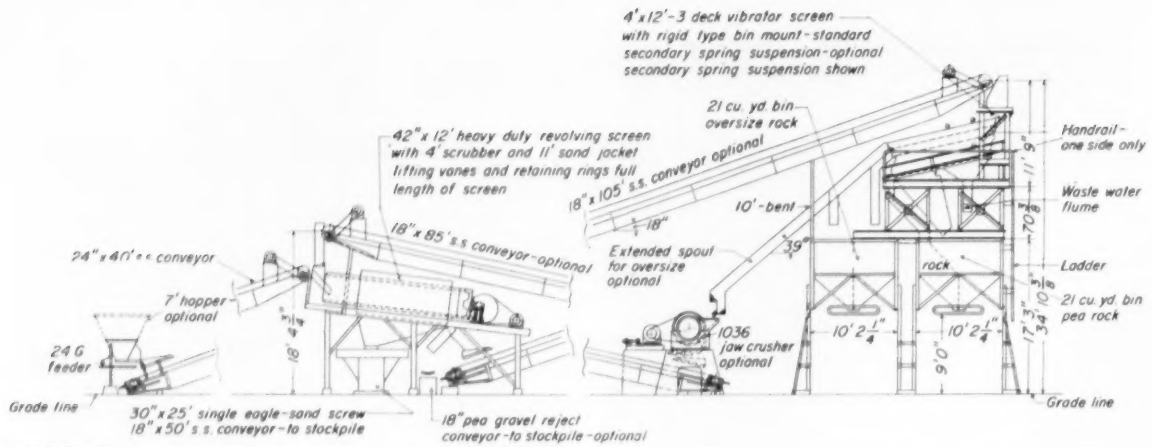
4'x12'-3 deck vibrator screen with rigid type bin mount-standard secondary spring suspension-optional secondary spring suspension shown
21 cu. yd. bin-oversize rock
42"x 12' heavy duty revolving screen with 4' scrubber and 11' sand jacket lifting vanes and retaining rings full length of screen
18"x105' s.s. conveyor optional
Handrail-one side only
Waste water flume
10'-bent
18"
18"x 85' s.s. conveyor-optional
24"x 40'c.c conveyor
Extended spout for oversize optional
39"
rock
Ladder
7' hopper optional
21 cu. yd. bin pea rock
24 G feeder
1036 jaw crusher optional
10' 2 1/4"
10' 2 1/4"
9'0"
Grade line
30"x 25' single eagle-sand screw 18"x 50' s.s. conveyor-to stockpile
18"pea gravel reject conveyor-to stockpile-optional
Grade line

FIGURE 10. PIONEER PHOTO

A.S.T.M. A 325-55T WASHERS

WHEN YOU NEED THEM!

Michigan's New Mackinac Bridge—Detroit Times Photo

For fast reaction to your order, buy high strength construction washers direct from the manufacturer. You save time and money.

Hard, flat and concentric, these washers are a Whitehead specialty. They are made from prime steel to exact A.S.T.M. specification A-325.*

Standard sizes stocked for immediate heat treat are: 1/2", 5/8", 3/4", 7/8", 1", 1 1/8" and 1 1/4". Other sizes available on request.

Delivery is fast and dependable. Try it and see.

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* Hardness of 68 to 75 Rockwell A, and carburized to a minimum depth of 0.015 inch. Quenched and tempered (non-carburized) washers have a hardness of 35 to 45 Rockwell C.

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PRODUCING AGGREGATES... continued

Frequently it is desirable to set up a washing and sizing plant in such a way that the sand plant is separate from the units producing the coarse aggregate. This is especially true where pits run heavily to sizes ranging down from pea-gravel (3/8 in. minus). By so doing, it is possible to reject, say, pea-gravel size if it is in excess. Production of 100% fractured chips is possible by using the crusher and returning material to the vibrating screen, by-passing the revolving screen. **Fig. 10** shows this type plant.

A further advantage is that such an arrangement minimizes stacking of units, thus facilitating dismantling and moving. Also, a plant of this general design permits use of either section separately when conditions warrant. It is one of the better types of plant for job-site washing and sizing for heavy construction projects, working in material that does not require a large revolving scrubber or a log washer.

Portable Plants

In considering portable plants for washing aggregates, bear in mind that they have limitations as to practicability. These limits are defined by availability of adequate wash water and the extent of auxiliary equipment required to complete the plant for the job. These items may involve such things as scrubbers, log washers, coarse and fine material screws, scalping and classifying tanks, and bins. In some cases it may be desirable to place these units on rubber, too; in other cases, not. Much depends on how extensive the use of these items will be on subsequent jobs. Thus the producer should always ask himself, "Should

Cedarapids helps Florida Turnpike Authority achieve

THE LOWEST COST PER MILE OF ANY MAJOR TURNPIKE IN THE COUNTRY!

By producing 2,000 tons of low-cost specification bituminous concrete per day, this big Cedarapids G60 plant did more than its share in helping Florida complete its Sunshine State Parkway at the lowest cost per mile yet! The all-automatic G60 kept well ahead of the whirlwind paving program in spite of a difficult aggregate problem.

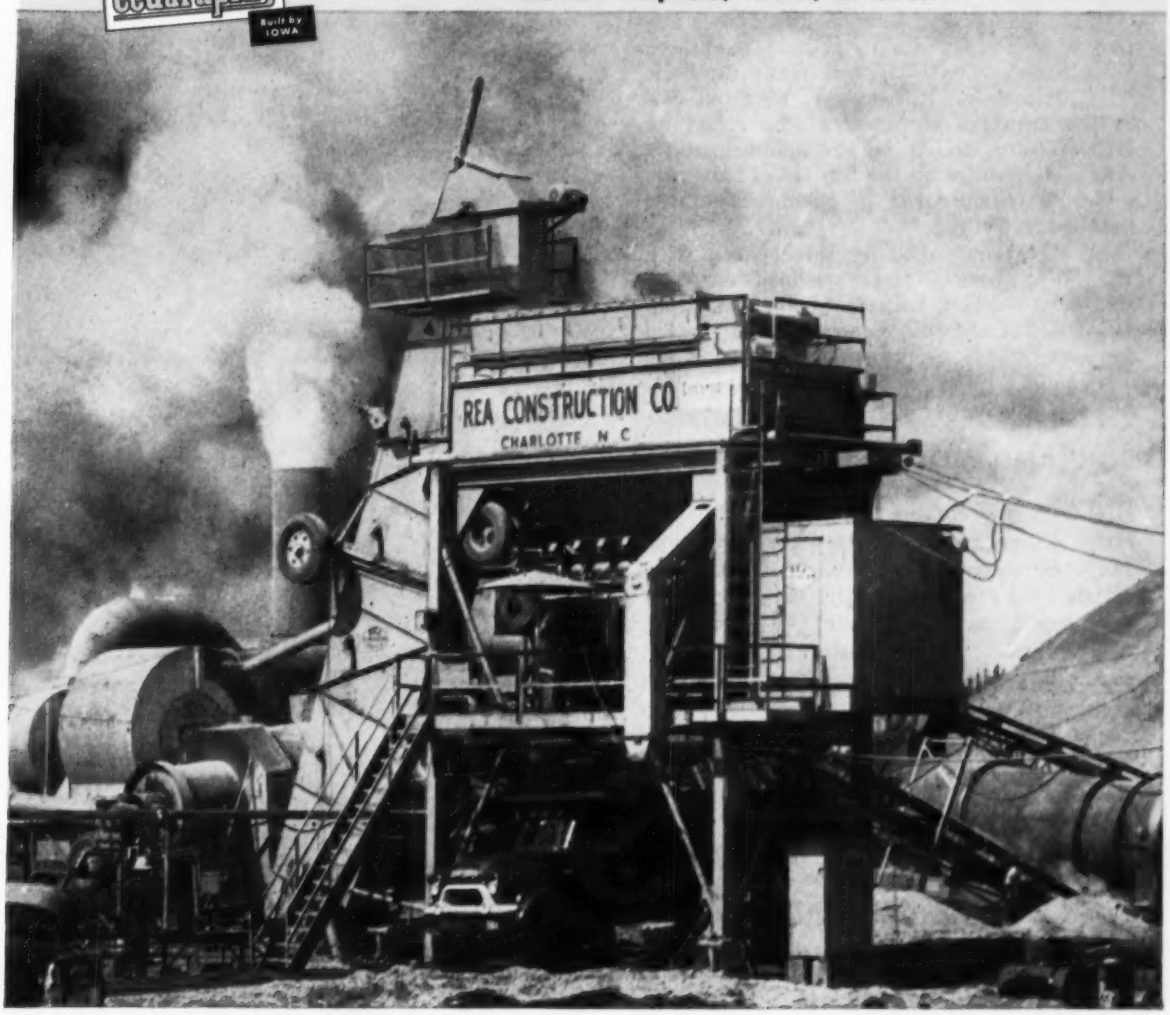
This plant is one of two G60's owned by Rea Construction Company of Charlotte, N. C., which is well set to beat competition on any job demanding big-quantity production of highest quality bituminous concrete.

It takes G60 design and efficient operation to handle big turnpike or airport paving contracts at the most profitable levels. All-automatic operation clips seconds off cycle time and controls the mix to meet strictest specifications . . . there are no profit-eating delays for changeover from mixing binder course to producing wearing course, or providing various mixes for the drive-in trade . . . and typical Cedarapids-Quality construction cuts maintenance costs to the absolute minimum.

And remember . . . if you need less production for smaller jobs, you'll get the same high profit margin with a Cedarapids G40 or H15 plant. Ask your Cedarapids distributor for information about the complete Cedarapids bituminous mixing line before you bid on your next job.

Cedarapids
Built by IOWA

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U. S. A.



KANSAS TURNPIKE: MARVEL OF FAST ROAD BUILDING

236 miles of super highway put through in 2 construction seasons—that's the engineering construction marvel of the $140 million Kansas Turnpike which opened to traffic in October of 1956.

Super compaction equipment played a big part in this record building, too; the Freeto Construction Co., Pittsburg, Kans., and the T. L. James Co., Ruston, La., were but two of the turnpike contractors who relied on BROS 50-ton Roll-O-Pactors to obtain 100% AASHO densities on the top 18" of subgrade and 95% on the lower 18". Compaction was handled in 6" lifts.

Specifications called for three passes with the 50-ton rollers after specified densities had been reached. Because of soil variations, the CBR (California Bearing Ratio) varied between 50-75% on the subgrade.

FOR WIDE VARIETY OF ROCK, SOIL AND MOISTURE CONDITIONS

Roll-O-Pactor compaction results fulfill the strict design criteria written for the whole range of acceptable turnpike subgrade materials. Why? Because BROS compaction engineers grew up with heavy earthwork consolidation . . . developed and pioneered the vital 19° wheel oscillation and pitch control features of heavy rubber tire rollers . . . cooperated with federal and state engineers in proving the unmatched value of this equipment for consolidation and densification of subgrade materials.

Write for complete Roll-O-Pactor information or see your nearest BROS Distributor.

ROAD MACHINERY DIVISION
BROS *Incorporated*
(formerly Wm. Bros Boiler & Mfg. Co.)
1057 TENTH AVE. S. E. • MINNEAPOLIS 14, MINN.

Top Photo: Freeto Construction Company's BROS Model 450 roller compacting subgrade on the Turnpike. *Center:* T. L. James Co. Model 450 compacting subgrade on Section 11 of the Turnpike. *Bottom photo:* Compaction on the same section withthe BROS SP-54 Self-Propelled rubber tire roller.

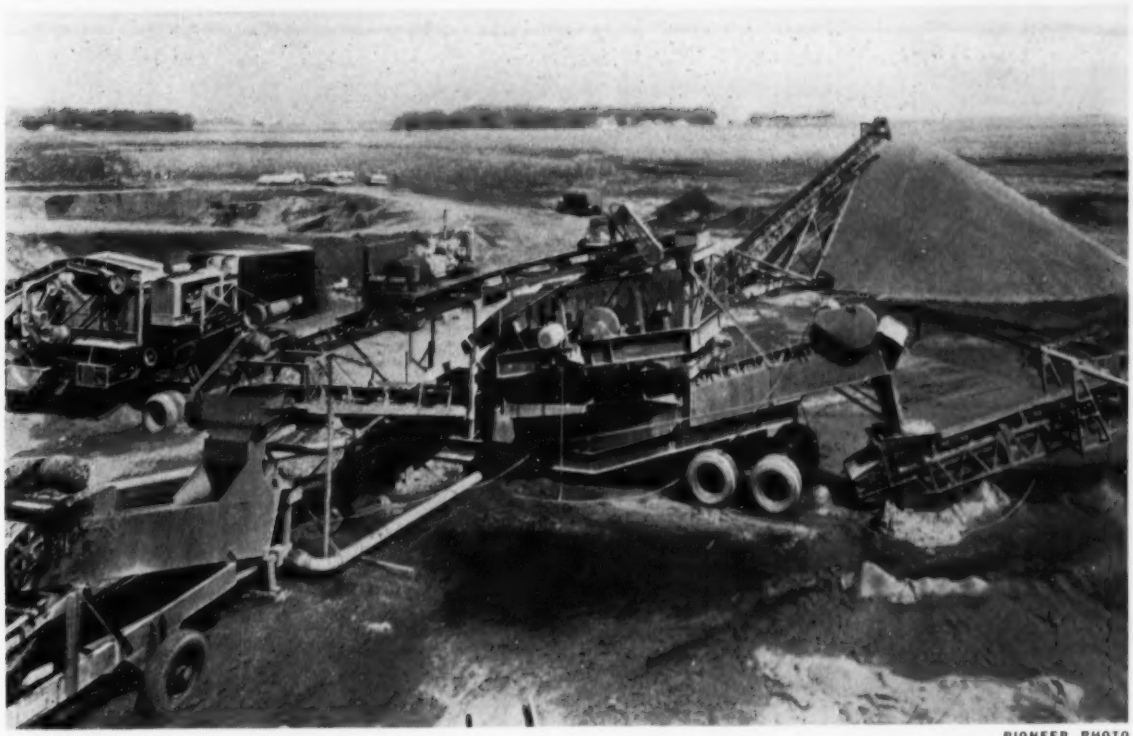


FIGURE 11

PIONEER PHOTO

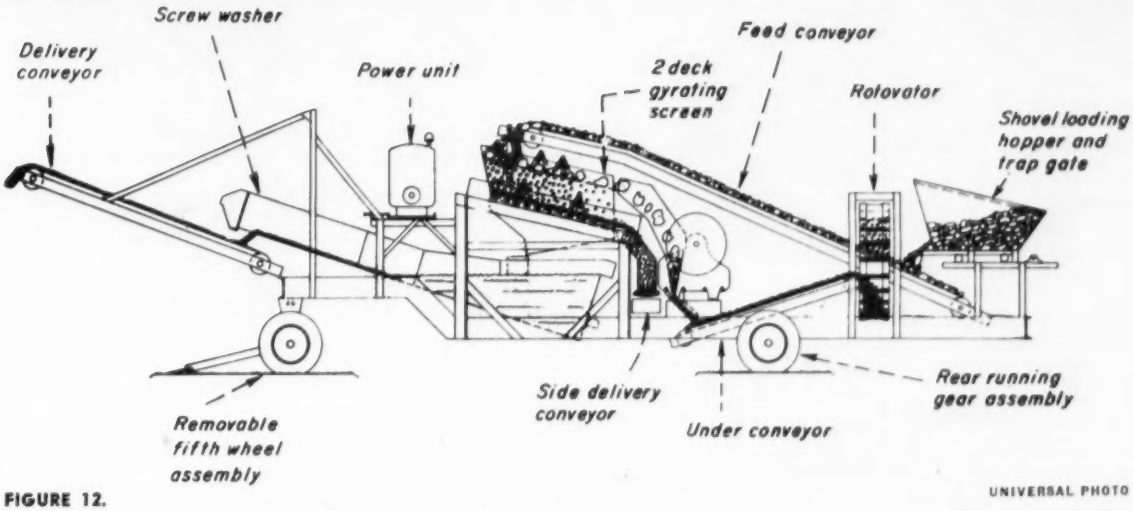


FIGURE 12.

UNIVERSAL PHOTO

I invest the extra money required for the wheels and rubber, or should I buy a semi-portable plant and save some 'dough,' knowing that there will be some erection costs connected with the semi?"

Among portable plants available there are two basic types: (1) those having a "wet" vibrating screen followed by a dewatering screw or drag and (2) those with a revolving scrubber followed by a sizing and rinsing screen and a dewatering screw. In the latter, the screw may be a part of the plant itself, or it may be set up as an auxiliary.

Fig. 11 shows a portable plant of the first type. Its main unit consists of a 5x12-ft three-deck vibrating screen equipped with spray-bars, and a 30-in.x25-ft long fine material screw washer-dewaterer. This unit can be used alone or with one or two coarse material screws, depending on the job to be done. The chassis is designed for Fruehauf hitch. When necessary, a log washer can be added to clean up the larger size material. To make this type plant completely portable, the coarse screws and log washer can be equipped with chassis and wheels. Note that the coarse screw chassis also carries an added rinsing dewatering screen, so that the fines and dirt passing through it can be flumed away. Plants of this type are capable of simultaneously turning out fairly large quantities of two sizes of coarse material, one of sand, and an oversize.

Fig. 12 shows a somewhat similar plant, but with a crusher for

FIGURE 13. UNIVERSAL PHOTO

FIGURE 15. PIONEER PHOTO

reduction of oversize and a return system to the screen. Water is sprayed onto the two-deck screen, which produces one size aggregate plus sand. Portable plants with vibrating washing-sizing screens frequently are set up to follow portable gravel crushing plants.

Fig. 13 shows a plant equipped with a revolving scrubber discharging to a vibrating rinsing screen. Action of scrubber, screen and sand screw (in a plant of similar design) is shown schematically in **Fig. 14.** A plant for extremely dirty material and close sizing is shown in **Fig. 15.** This plant has a revolving scrubber of large dimension, a shaker type horizontal screen for sizing and rinsing, and a roll crusher for reduction of oversize. For dry screening and crushing, material feeds directly onto the shaker screen from the same end of the plant as the scrubber feed. Changing the screen hanger location reverses movement of material across the screen.

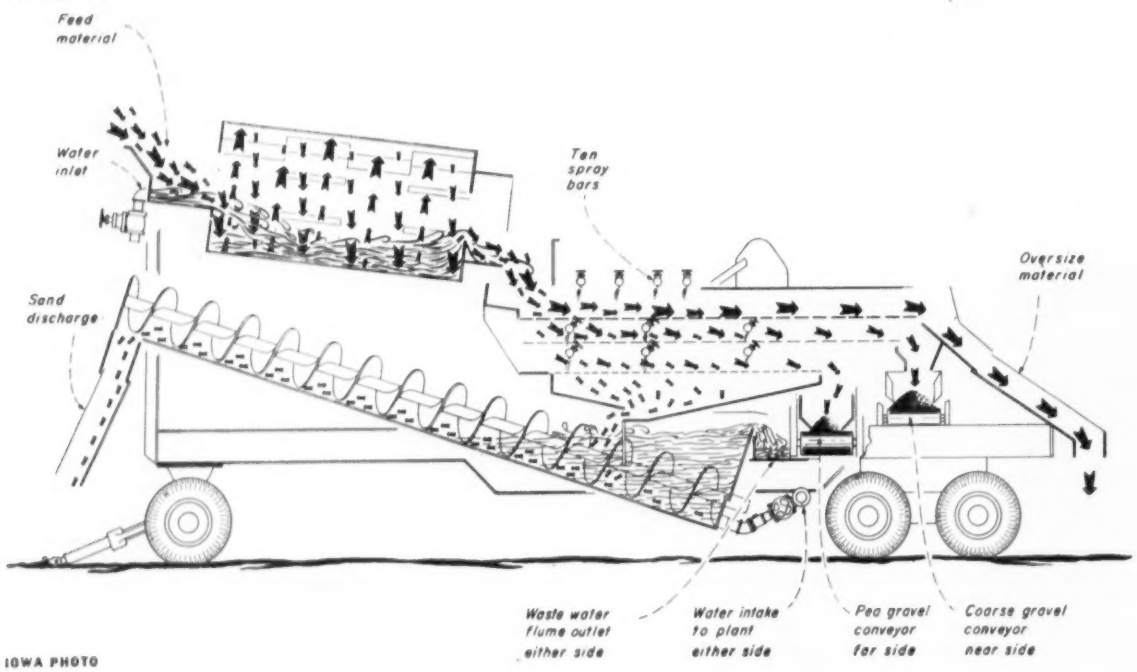
It is customary, when moving a plant equipped with a revolving scrubber, to remove the scrubber to cut down height and weight.

Troughed Screen for Washing

Of more recent development, and gaining in popularity in some areas, is the trough washing screen **(Fig. 16).** Developed primarily for mining applications, its use has been extended to gravel processing where a high-pressure water

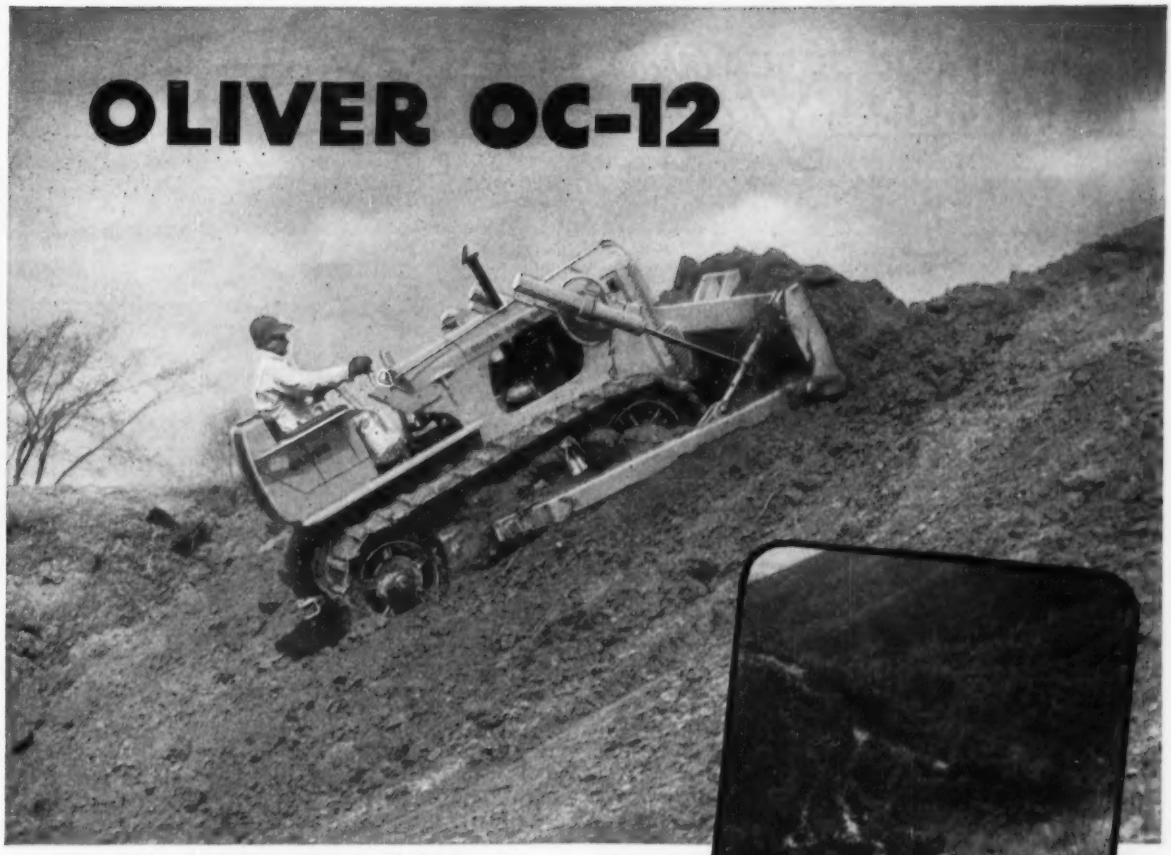
continued on page 264

FIGURE 14.



IOWA PHOTO

OLIVER OC-12



Number 1 hill climber...

it climbs 70% grade!

This OC-12 in actual work conditions pioneered grades up to 70% in poor-traction soil... handled steep road building assignments.

Of course, you don't *work* at 70% grades! But top honors for the Oliver OC-12 at a recent hill-climbing competition prove that you have the correct power-to-weight ratio that means top tractor performance *wherever* your job takes you.

Here's balanced performance at its best...plus a whole set of advanced features to give this eager crawler its outstanding work and pioneering ability.

Oliver design gives you high, unobstructed clearance. You go *over* mud, stumps, rocks, etc. Even the final drive housing is close to the track frame and protected—not out in the open where it could pack up in deep going.

With Oliver POWER-TURN you get full-time working power, even on turns. You make short turns—but *always* with two-track power and complete control. This means straight-line working advantages all the time. What's more, steering procedure never changes, regardless of grade...uphill or down. No clumsy cross-hand steering ever. Works with full line of attachments. High-torque 53 d.b.h.p. diesel; also gasoline model.

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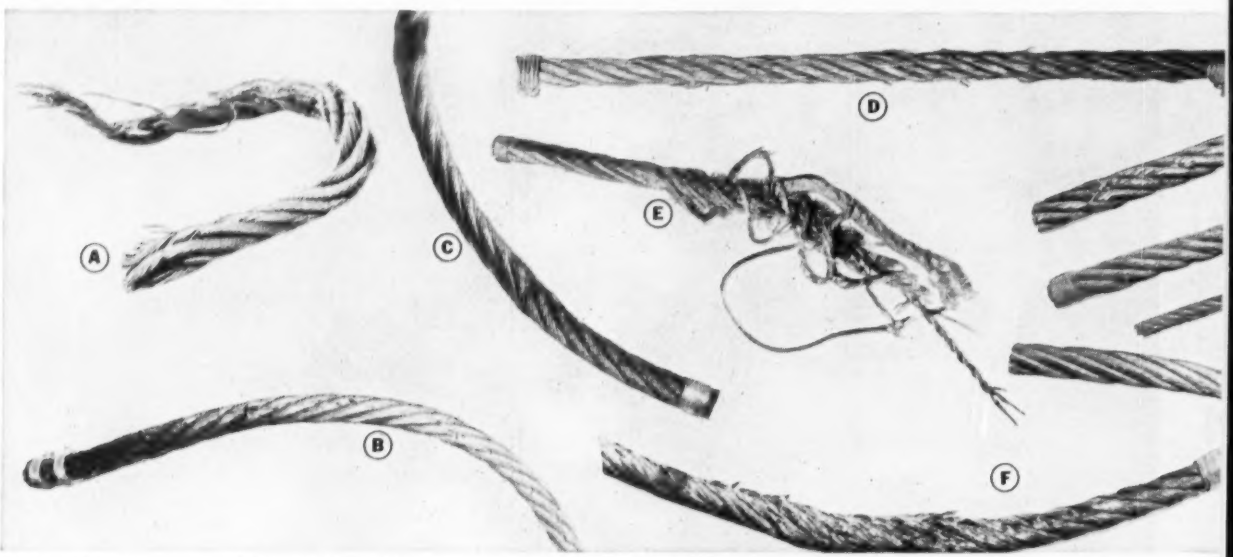
a complete line of industrial wheel and crawler tractors and matched allied equipment

Tuffy Wire Rope Tips



Tuffy gives you a quick run-down here on some of the mortal enemies of wire rope — the abuses that quickly ruin rope efficiency or end its life abruptly long before you have had the service you paid for.

Even the best wire rope is a sitting duck for the enemies which won against the wire rope pictured on these pages. When you avoid or eliminate them you make important gains in longer rope life, better service and greater economy. Remember, your Tuffy distributor will be glad to work with you against these and other wire rope hazards.

It's the "end of the line" for wire rope when these things happen:

A. Mangled in a wedge socket. Here's the result of improper socketing. This fatal rope injury was caused by a poorly designed or worn out wedge socket. Failure at the dead end can damage other sections of the rope.

B. Rusty road to ruin. Rust — No. 1 enemy of steel — takes a heavy toll in wire rope life. It's an insidious, silent type of killer, often doing irreparable damage before it's even noticed. The one-strand break shown above resulted when the rope was allowed to become rust-bound through lack of lubrication. With other conditions ideal, tests show properly lubricated rope has up to 10 times the life expectancy of dry rope.

C. The crushing blow. The Sunday punch for this piece of wire rope was delivered by a tractor cleat — just one of many crushing injuries that result when wire rope is run over or banged into by a hard, sharp object. Even the best rope is no match for this kind of mistreatment.

D. Strangled by misfit sheaves. When the bearing surface of a

Tuffy Special Wire Ropes are tailored to special use. Ordering is easy

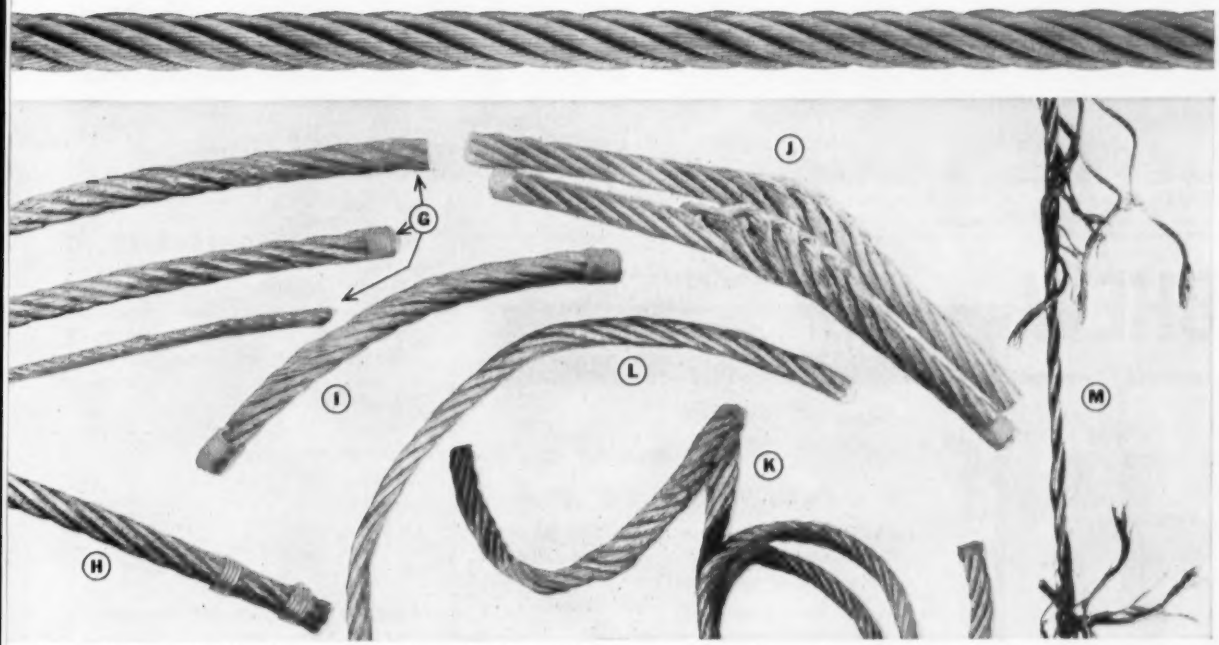
Tuffy Scraper Rope

Moves more yardage per foot because **Tuffy** Scraper Rope is specially built to take the beating of extreme drum-crushing abuse. Flexible; withstands sharp bending; hugs sheave grooves and winds snugly and smoothly on drums. High resistance to load shock on slack line.

Tuffy Dragline Rope

A longer-wearing line for all dragline operations. Special abrasion resisting construction which also gives extra flexibility. Tuffy Draglines also spool better, ride better on grooves and hold tightly to drums when casting. Consistently dependable in handling any material — wet or dry dirt, sand, gravel, rock, cement or minerals.

How wire rope is crippled and killed without a fighting chance



sheave is too small for the rope diameter, pinching action quickly destroys the rope especially when it is overloaded. The one shown above was knocked out in just 1½ hours of service.

E. Apparent suicide! This rope jumped out of sheave and was soon destroyed by pulling around the shaft. Actually it was a case of sudden slack which threw the rope out of the sheave.

F. This rope came to an untimely end by operating over a sheave that did not turn. Note the exceptionally heavy abrasion on one side of the rope.

G. Victim of "the bends." Excessive bending soon wears out rope. Generally, more flexible ropes are used as bending stresses increase (with decrease in tread diameter of sheave or drum). If a rope is operated on a sheave too small for its bending characteristics, early failure is certain. Through an exhaustive series of bending tests, Union engineers have compiled data that you can use to be sure you get the rope construction that will give you the longest service life. Ask about it.

H. On the "blink" from a kink. This open kink resulted from mishandling of wire rope. Guard against kinks by proper winding on the drum. Never pull a loop smaller; always enlarge it, then straighten out the rope.

Crushed and worn from "beatings on the drum." Drum wear gives wire rope severe punishment even under normal operating conditions. This wear is found at the cross-over points and at the flange. Excessive drum crushing results from operating on too large or too small a drum. Here are typical "drum beatings":

I. Cross-over wear

J. Cross-over crushing on drum

K. Drum-crushing on oversized drum

L. Drum-crushing on undersized drum

Although drum wear cannot be eliminated, its effects can be greatly reduced. Under properly engineered procedures, two and three times the service can be obtained from the same line. Union Wire Rope engineers will help you with this problem. Get in touch with us for more information.

M. Overloaded — soon exploded. Wire rope is "prescribed" for a given use on the basis of breaking strength plus a safety factor of 4. The grade of steel, type of construction and size of the rope determine tensile strength. It must be properly related to the loads it will carry, or expensive and dangerous early failures are likely to occur.

Just say **Tuffy** give length and size, and forget complicated specifications.

Tuffy Slings and Hoist Lines

Here's a team that cuts hoisting and down time costs in all types of materials handling.

Tuffy Slings are made of a patented, 9-part machine-braided fabric that stays extra flexible, and isn't materially damaged by knotting or kinking.

Tuffy Hoist Line is a special construction with the extra flexibility and toughness for longer service life on overhead cranes, derricks and clamshells.

Tuffy Dozer Rope

Long after ordinary ropes are worn out, **Tuffy** Dozer Rope has the stamina it takes to keep on handling the blade. 150' reels mounted on your dozers let you cut off worn sections without wasting good rope. This unbeatable combination piles up sizeable savings on dozer rope costs.

Your Tuffy distributor will help check your equipment

Condition of equipment is a big factor in longer rope life and greater economy. Your Tuffy distributor will help you check equipment and operating conditions to make sure everything is in your favor for getting the greatest service out of your Union wire rope. Ask him to lend a hand in a thorough inspection. He'll be glad to do it. And if there are still knotty problems, Union Wire Rope Corporation engineering department will help further.

union Wire Rope **corp.**

2270 Manchester Avenue, Kansas City 26, Mo.

2

Specialists in high carbon wire, wire rope, braided wire fabric, stress relieved wire and strand

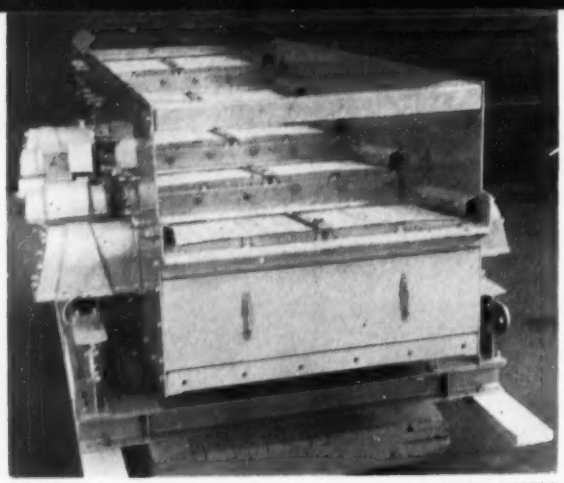


FIGURE 16.

TYLER PHOTOS

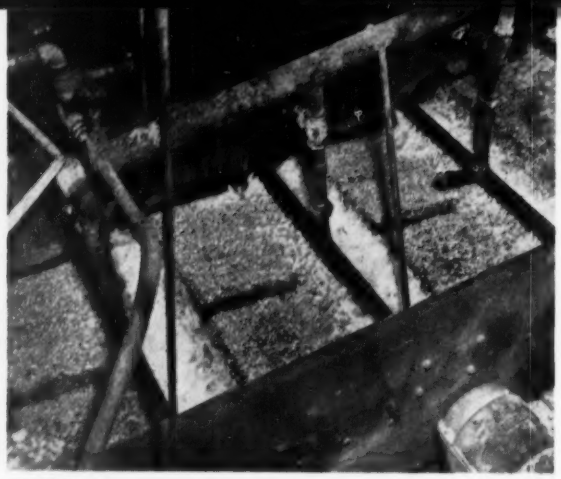
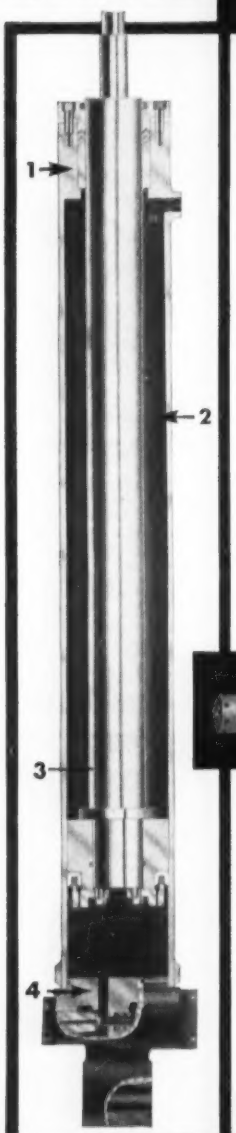


FIGURE 17.

BHEW

Made-to-Order

HYDRAULIC CYLINDERS

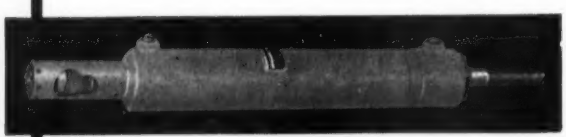


Quality That Pays Off in Improved Performance for Construction Equipment

1. Cylinder barrel and non-adjustable gland welded into one piece, eliminates joint, makes small O.D. in large single and double-acting hoist cylinder.
2. Accurately honed barrel.
3. Hard chrome-plated rod.
4. Flow regulating or pilot operative check valve in base, when required.

Compactness! Efficiency! Close Tolerances! Outstanding operational performance! You get them all in BHEW cylinders. They require minimum mounting space. There is no tooling charge for BHEW cylinders, built to meet your specifications and delivered on schedule.

Send us specifications of your requirements, for full information.



BHEW cylinders are available in standard and special O.E.M. designs . . . single or double acting and telescopic; 1½" to 8" bore; strokes up to 156"; oil hydraulic service in 1,500 psi or 3,000 psi working pressure, pneumatic up to 150 psi; cup-type, ring-type or O-ring construction; choice of mounting.

Do you have problems involving cylinders? Our extensive engineering service is available to you without charge.

BHEW

BENTON HARBOR ENGINEERING WORKS, INC.
622 Langley Avenue, St. Joseph, Michigan

PRODUCING AGGREGATES . . . continued

spray is enough to loosen deleterious matter. The screen consists of steps of screening area, between which are pockets or troughs into which the material falls. A high-pressure spray is directed into these troughs and the combination of the "circle throw" and the sprayed water are effective in cleaning the material and assisting in the screening job. **Fig. 17** shows such a screen in action.

Amount of Water for Washing

No hard and fast rule for the amount of water required for washing coarse aggregate can be established. A rule-of-thumb guide, however, is suggested for washing under average conditions. This rule indicates that 10 gpm are required for each cu yd of material produced per hr. For example: 50 cu yd per hr will require 500 gpm.

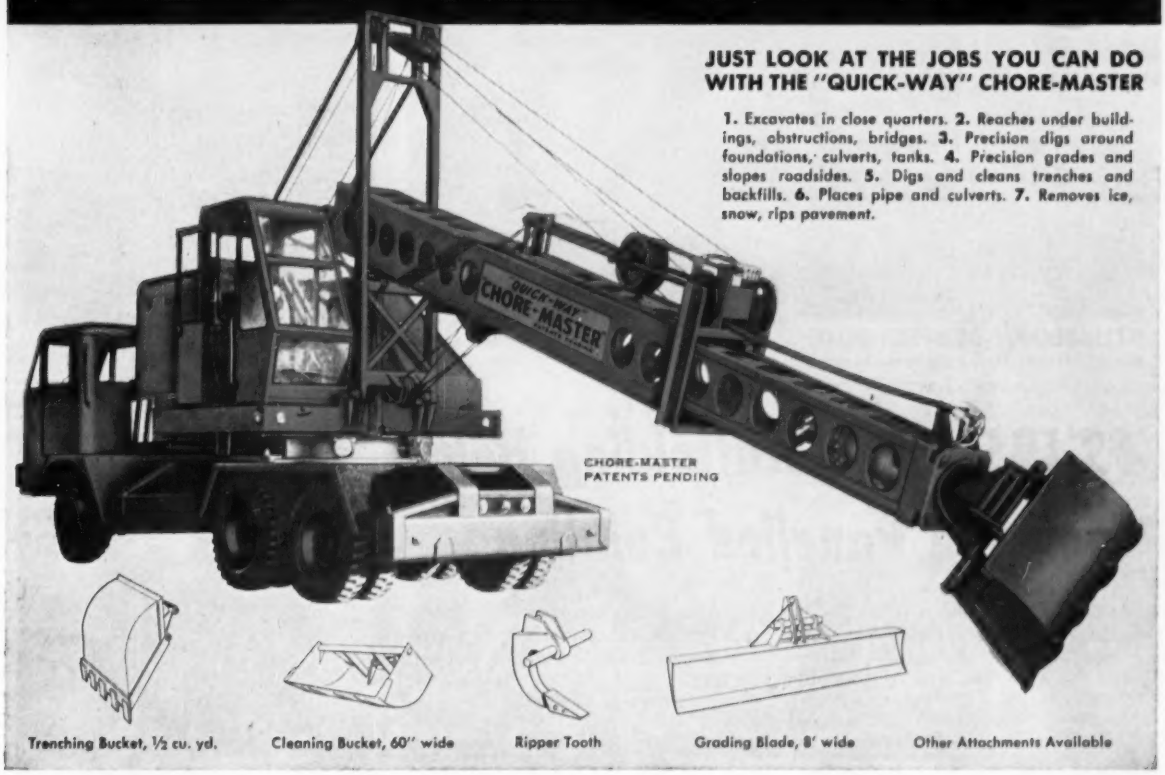
Table V (p. 248) helps to determine the number and size of spray nozzles to provide the required gallonage for a given nozzle pressure. For example: If nozzle pressure is 50 psi, each ¼-in. nozzle will give 8.0 gpm and each 5/16-in. nozzle, 12.5 gpm. Thus, if 600 gpm are required, it will take 75 ¼-in. nozzles (600 ÷ 8) or 48 5/16-in. nozzles (600 ÷ 12.5).

This table can be used also to determine the pressure required to deliver a specific gallonage through the nozzles. For example: If 500 gpm are required and 60 ¼-in. nozzles are used, each nozzle will give 8 gpm at 50 psi for a total of 480 gpm (60 x 8). If pressure is stepped up to 60 psi, each nozzle will give 8.8 gpm for a total of 528 gpm (60 x 8.8).

The next article in the series on Producing Aggregates will discuss washing of fine material.

For the first time... an all-purpose hydraulic attachment for crane shovels!

The new "QUICK-WAY" CHORE-MASTER!



JUST LOOK AT THE JOBS YOU CAN DO WITH THE "QUICK-WAY" CHORE-MASTER

1. Excavates in close quarters. **2.** Reaches under buildings, obstructions, bridges. **3.** Precision digs around foundations, culverts, tanks. **4.** Precision grades and slopes roadsides. **5.** Digs and cleans trenches and backfills. **6.** Places pipe and culverts. **7.** Removes ice, snow, rips pavement.

Trenching Bucket, ½ cu. yd. | Cleaning Bucket, 60" wide | Ripper Tooth | Grading Blade, 8' wide | Other Attachments Available

The new "QUICK-WAY" Chore-Master is the first interchangeable hydraulic grading-digging attachment that makes dozens of jobs possible with one attachment. Now with the new Chore-Master, five crane shovel models, and the most complete standard line of attachments, "QUICK-WAY" is the most versatile machine you can own.

Two large hydraulic cylinders and one hydraulic motor operate the reaching, digging and swivel action of the boom and bucket. A single control lever guides all these actions with a simple twist of the wrist for sure, precision, hydraulic control.

This new attachment can be changed quickly to any of the other "QUICK-WAY" standard attachments.

Now a "QUICK-WAY" is the most versatile machine you can own—with MORE ATTACHMENTS to handle MORE JOBS with greater profits:

CHORE-MASTER • PILE DRIVER • DRAGLINE
CLAMSHELL • CRANE • MAGNET
TRENCH HOE • SHOVEL

MANY OTHER SPECIAL TOOLS ARE AVAILABLE

NOW! 5 "QUICK-WAY" MODELS WITH MORE BIG SHOVEL FEATURES:

125A—6/10 yd.—12½ Ton **105A**—5/10 yd.—10½ Ton
85A—4/10 yd.—8½ Ton

85AC Crawler **105AC** Crawler

"QUICK-WAY" TRUCK SHOVEL CO.
A Koehring Subsidiary Denver, Colo.

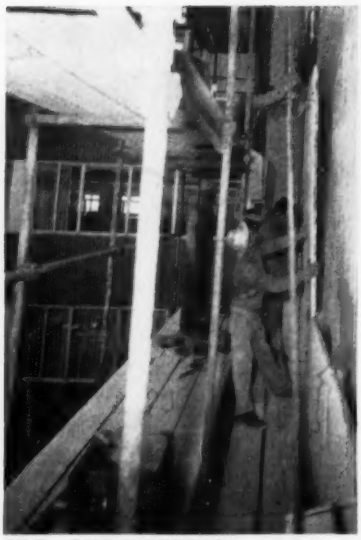
"QUICK-WAY" TRUCK SHOVEL CO. Dept. 397
2401 East 40th Ave.,
Denver 5, Colorado, U.S.A.

Please send me the following "QUICK-WAY" catalogs:

☐ Chore-Master ☐ 125A
☐ 85A ☐ 85AC Crawler
☐ 105A ☐ 105AC Crawler

Name.....
Title.....
Company.....
Address.....
City and State.....

"TUBELOX" SCAFFOLDING gives working platforms as well as support for monorail system. Note hoist tower in center of new wing.



MO-SAI PANELS are suspended from monorail and guided to place by masons. Gasoline motor provides power for vertical movement of these heavy panels.

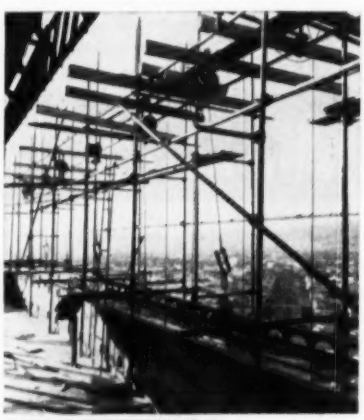
43,195 ft. of Scaffolding Helps Complete Panelled Building

BUSINESS has been so good for The Prudential Life Insurance Company, Western Home Office, Los Angeles, that a north wing addition to the main building (1949) was needed. Since the architects, Welton Becket & Associates (original designers also), believed that the same dignified beauty of the ceramic veneer and Mo-Sai panels used on the first structure was desirable, it was specified.

To speed the handling of these 7′ x 6′6″ 1000-lb. panels, William Simpson Construction Company, general contractor, uses 43,195 ft. of "TubeLox"® Scaffolding, a 169′-high "Gold Medal"® Steel Hoist Tower, and raising and lowering drum mechanisms taken from "Gold Medal" Safety Suspended Scaffold Machines. The drums provide cable support and height adjustment for a monorail system which transports panels and grout (in special 8 cu. ft. buckets designed by A. H. Maxted, mason contractor).

The "TubeLox" Scaffolding provides ample working platforms for masons. The monorail height-adjusting drums are attached to beams laid across this scaffolding at top. Controlled by intercom signal system, both panels and grout buckets travel up the hoist device, then on to the monorail. A 25 hp. gasoline motor provides power to the monorail for spotting these materials exactly where needed. Tried elsewhere, too, this combined men-and-materials-handling equipment has proved most efficient for precast construction work.

SPECIAL GROUT buckets designed by A. H. Maxted are also supported by and moved along monorail speeding the application of concrete for holding panels.



VIEW OF THE TOP of the "TubeLox" Scaffolding showing how drum mechanisms are supported by beams. Drums hold cables which provide height adjustment for monorail.

To help you with your scaffolding and concrete shoring methods, PS offers a complete nation-wide engineering service available to you locally. See the Yellow Pages in your 'phone directory for the nearest Patent Scaffolding office or representative that sells and rents "Gold Medal" Scaffolds.

FOR GREATER SAFETY...EFFICIENCY...ECONOMY

GOLD MEDAL LADDERS SCAFFOLDING

THE PATENT SCAFFOLDING CO., Inc.

38-21 12th Street, Dept. CM&E, Long Island City 1, N. Y.

West Coast: 6931 Stanford Ave., Los Angeles 1, Calif.

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Branches in all Principal Cities

Construction Men in the News . . .

Gratitude Will Cost Him $50,000

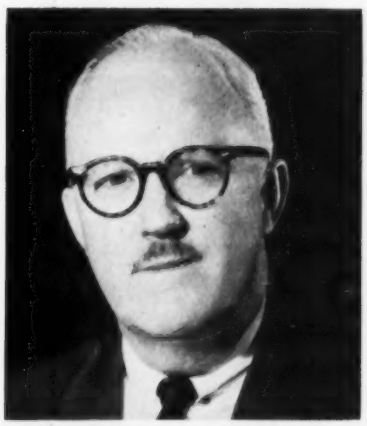
RAGNAR BENSON, Chicago contractor who came to the U.S. as a 12-year-old immigrant and became one of the country's top industrial contractors, is taking 69 relatives and employees on a 20-day visit to Sweden. The trip, which will cost him $50,000, is a demonstration of gratitude to the people who have helped him in his climb to success.

"It's been my dream for years," Benson explained, "to some day show my gratitude to the people who were so kind to me when, as a boy of 12, I first came to this country."

The group took off from Chicago's O'Hare International Airport on April 14 aboard a DC-6 chartered from Scandinavian Airlines. They flew directly to Malmo, Sweden, a city 75 mi from Benson's native town of Almhult.

Thirty-four of the passengers are members of Benson's family; thirty-three are employees and their families; two others are a minister and his wife, friends of Benson.

Benson came to the United States from the Almhult farm owned by his parents in 1911. He worked as a bricklayer's apprentice at $5 a week, then as a part-time haberdashery salesman, next as a journeyman bricklayer, and finally as a masonry foreman before he started Ragnar Benson Co. in 1922. His firm now does a yearly volume of about $80 million in industrial building. Benson is the firm's president and chairman of the board.



HARRISON H. ROBERTS is a new vice-president of Intrusion-Prepakt, Inc., and Prepakt Concrete Co., Cleveland, Ohio, concrete construction and foundation stabilization contractors.

Before his appointment, Roberts was manager of foreign operations, a post he assumed when he joined the organization in early 1956. He will continue to supervise foreign operations as vice president.

Before joining I-P, Roberts was chief engineer for Walsh Canadian Construction Co. on an excavation contract for the St. Lawrence Seaway Authority. Before that he was in charge of engineering for Brown and Root, Inc., of Houston, Texas on extensive irrigation and flood control work in Haiti.

HERMAN B. BLOCK (above) is the new vice president for procurement, and **HERBER S. MAFFETT,** (right) new vice president for trade relations of the Merritt-Chapman & Scott Corp.

Block joined the company in 1952 as assistant to Rolland O. Baum, executive vice president for procurement. He formerly was director of purchases for Devoe & Raynolds Co. of Louisville, Ky., a division of MC&S's chemical, paint, and metallurgical department.

Maffett has been MC&S's director of trade relations since January, 1956. He joined the company as trade relations manager in 1954. Previously Maffett was assistant to the chairman of the board of New York Shipbuilding Corp., an MC&S subsidiary.

Three new assistant vice presidents also were named. They are EDWARD BRAUSE, in charge of MC&S public relations; FRANK N. OBERLE, of the Marine Salvage Division; and HARRY W. POWELL, in charge of purchasing for the company.

KENNETH F. COX, has been appointed manager of Dravo of Canada, Ltd., subsidiary of the Dravo Corp., Pittsburgh, Pa. A member of the board of directors for the Canadian firm, he served three terms on the parent corp.'s junior board of directors and has been Dravo's chief engineer since 1953.

continued on next page

CONSTRUCTION MEN IN THE NEWS . . . continued

CARL F. INGWALSON, formerly estimator-engineer for the parent company, becomes chief estimator for the Canadian firm. He has been with Dravo since 1941 and served two terms with the firm's junior board of directors.

HUGH N. PENDLETON, JR., a field superintendent for Dravo since June of last year, has been named general superintendent of the Canadian company's general construction department. He has been with Dravo since 1928.

With the Corps of Engineers . . .

Lt. Gen. S. D. STURGIS, JR., former Chief of Army Engineers, who retired last September after 35 yr of service, has been named by the International Joint Commission as Chairman, United States Section, International Passamaquoddy Engineering Board. The board makes all engineering investigations and studies necessary to enable the International Joint Commission to prepare and submit to U.S. and Canadian governments a comprehensive report on the proposed Passamaquoddy Tidal Power Project in Maine and New Brunswick.

Col. ROBERT C. BAHR, former staff engineer, Atlantic Transportation Terminal Command, New York, becomes district engineer at Savannah, replacing Col. Rogers.

3,000,000 gallons of poured asphalt

. . . and no repairs to this distributor's

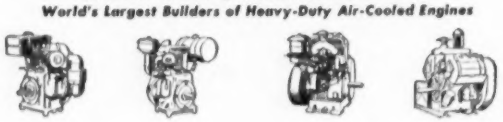
WISCONSIN Air-Cooled ENGINE

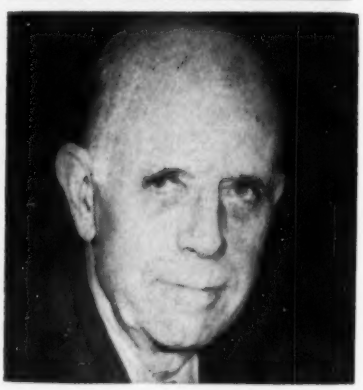
Quite a service record for this model VG4D 36 hp. Wisconsin Engine! It powers a distributor built by Standard Steel Works, Inc., North Kansas City, Missouri. A total of 3,000,000 gallons of asphalt have been poured by the distributor without making a single engine repair. The Wisconsin Engine drives a 375 GPM asphalt pump through a two-speed transmission and operates a high capacity blower, servicing two low pressure instant atomizing burners.

Don't be misguided. Here is positive proof that a Wisconsin Air-Cooled Engine is right for this kind of duty. On most models, a Wisconsin Engine substantially reduces cost and you have no cooling problems even in temperatures up to 140°F.

Write for complete details . . . bulletins S-143 and S-212.

WISCONSIN MOTOR CORPORATION
MILWAUKEE 46, WISCONSIN, U. S. A.
World's Largest Builders of Heavy-Duty Air-Cooled Engines





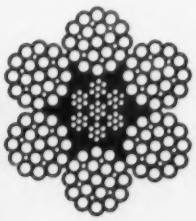
RICHARD M. JOHNSEN (top) and **NEIL O'LEARY** (bottom) are new vice presidents of The Foundation Company, New York heavy foundation contractors.

Johnsen currently is supervising construction of the difficult foundation for the new Chase-Manhattan Bank Building in New York City. He has been with the company since 1922, serving as superintendent and general superintendent.

O'Leary has been with the company since 1916. He started as the company's local purchasing agent in Cincinnati and, since 1929, has been general purchasing agent for all construction projects for the firm both in this country and abroad.

WICKWIRE

DOUBLE GRAY



WIRE ROPE

An extra improved plow steel wire rope with independent wire rope core, Double Gray gives you a rated breaking strength that's 15% greater than the catalog breaking strength of ropes of the same size and type made from improved plow steel.

Double Gray is *not* a new rope . . . *not* a rope that's offered to you on an "experimental" basis. Instead, it's been thoroughly tested in both the field and the laboratory. This means that you can now get extra high strength ropes with greater abrasion and crushing resistance . . . *plus* the knowledge that you're using a *safe* wire rope that's made by a company long known for its top-quality products.

Contact your nearby Wickwire Distributor or CF&I sales office for complete details and recommendations for your particular applications.

PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

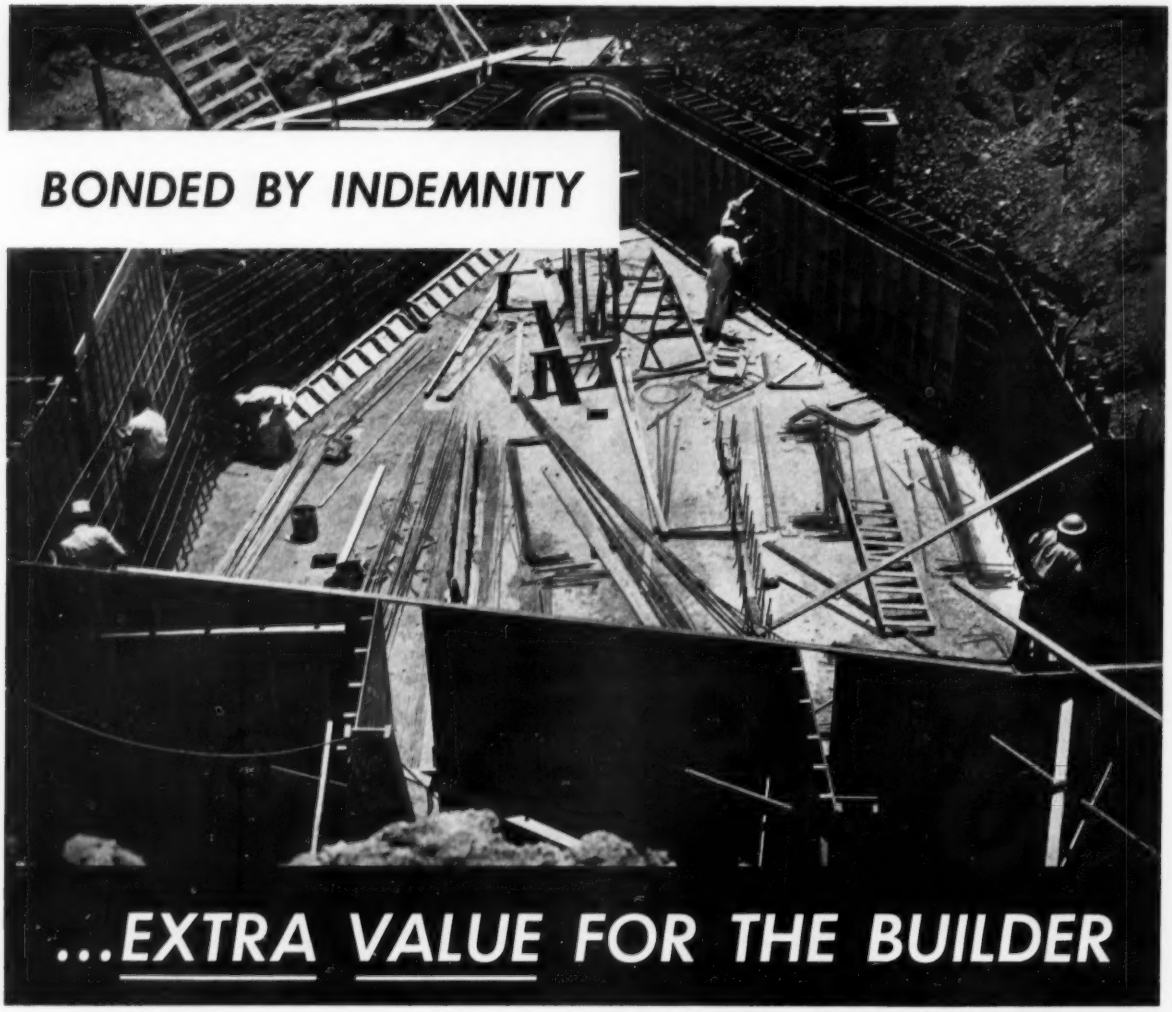
CF&I WICKWIRE ROPE A CF&I PRODUCT

THE COLORADO FUEL AND IRON CORPORATION—Denver • Houston • Odessa (Tex.) • Phoenix • Salt Lake City • Tulsa
PACIFIC COAST DIVISION—Los Angeles • Oakland • Portland • San Francisco • Seattle • Spokane
WICKWIRE SPENCER STEEL DIVISION—Boston • Buffalo • Chattanooga • Chicago • Detroit • Emlenton (Pa.)
New Orleans • New York • Philadelphia

LOOK FOR THE YELLOW TRIANGLE

5078

VALLEJO, CALIFORNIA is the location of this new Storm Drainage Gas Pumping Station, built with the protection of an Indemnity Insurance Company of North America contractor's bond.



BONDED BY INDEMNITY

...EXTRA VALUE FOR THE BUILDER

What should a contractor look for in a bonding company? The experience of Indemnity Insurance Company of North America, with its financial capacity and complete service facilities, gives a contractor just what he needs in handling his bond requirements. The Storm Drainage Gas Pumping Station at Vallejo is a recent example of the wide scope of Indemnity's dependable and efficient bonding service. All this adds up to 'Extra Value' in coverage and, for contractors who qualify, preferred rates* and prompt attention to their requirements.

*Not available in Louisiana and Texas

INDEMNITY INSURANCE COMPANY OF

NORTH AMERICA

PHILADELPHIA

One of the North America Companies which are headed by Insurance Company of North America, founded 1792.

Protect what you have ©

The Maintenance Shop . . .

Prepare Now for Summer Heat, Dust

CONTRACTORS who work their earthmoving equipment through the winter are careful to see that their rigs are checked for operation at low temperatures, but too often these same contractors neglect to prepare their equipment for hot weather.

Allis-Chalmers points out that summer heat—and the dusty working conditions that accompany it—affect the operation of critical engine components such as the lubrication, cooling, and air intake systems.

Even some so-called "permanent" anti-freezes can turn acid after a winter of use, and then the corrosive solution eats into the vital parts of the cooling system. This produces rust that clogs up the radiator and narrow water passages of the engine block. Soon the cooling system is not capable of handling the load placed on it by summer temperatures. Anti-freeze must be drained out as soon as the threat of cold weather is removed.

When the anti-freeze is drained and the system has been cleaned and flushed, it is a good idea to give the entire cooling system a spring check-up. Replace spongy or leaking radiator hose lines, check the water pump packing for air leaks, tighten up the fan belt if necessary, and remove the winter's accumulation from in front of radiator air passages.

Thermostats that fail to open completely, or that stick in the open position, are one of the most common causes of engine overheating. Check them by submerging them in water of known temperature.

During hot weather, the water level in the radiator should be checked daily. To prevent corrosion, add a water soluble inhibitor with a softening agent to the water at regular intervals.

TO KEEP THEM ROLLING during the dog days of mid-summer, pay particular attention to engine components such as the lubrication, cooling, and air intake systems.

ADDITIVES in some lubricants wilt in heat, cause lubricant to deteriorate more rapidly.

SUMMER DUST increases load on all filters. Cleaning schedules should be moved up.

Lubrication Systems

High operating temperatures and dusty working conditions cause most lubricants to deteriorate more rapidly. For this reason attention to lube schedules takes on added importance when the temperature goes up and dust begins to fly. If the oil filter gets dirty and the oil becomes contaminated quickly, the filter cleaning and oil drain periods should be moved up.

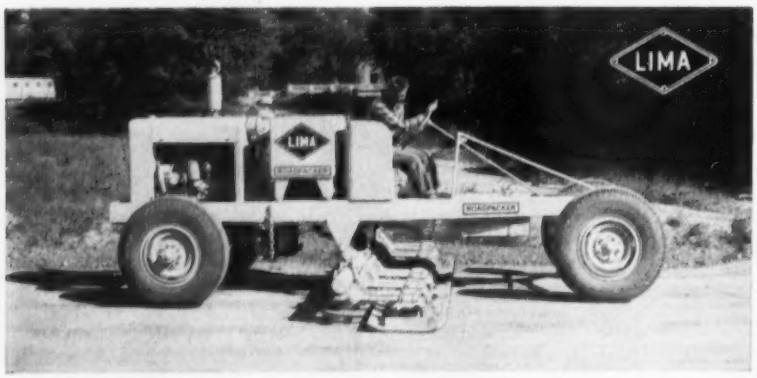
Follow the manufacturers' recommendations for the type of lubricants to use in the summer. Before each shift in hot weather, check the lubricant level in the engine crankcase, transmission, final drives, and other critical areas. Keep the lubricant level at the manufacturers' marking. If the level is too low—*or too high*—heat will build up. The engine oil heat exchanger takes on added importance in summer. Deposits on the cooling core will reduce the effectiveness of the heat transfer area.

Air Intake Systems

Especially in hot climates where dusty working conditions are to be expected, the life of the engine depends on the efficiency of the air cleaner system. The modern engine scoops up large quantities of air; a damaged hose, a loose clamp,

continued on next page

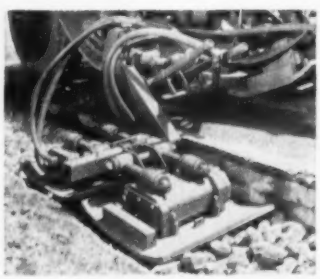
DESPITE DUST, snorkel attachments on air cleaners enable engine to get relatively clean air. Dust concentration 4 ft above hood is only fraction of that at hood level.



Cut your high-density compaction costs with the LIMA ROADPACKER

Macadam Bases—Coarse aggregate for bases up to 12 in. thick can be spread in a single layer, then uniformly compacted to final density by the Roadpacker over a 13 ft., 1 in. width. This single course construction, possible only with vibrators, reduces spreading time by half. Also it eliminates the need for backtracking all the equipment for the second pass; and contour shaping is done once—instead of twice. In waterbound work, the Roadpacker's tamping and vibrating action runs in screenings solid from top to bottom. Only three spreads of screenings are required, and much of the hand labor of spreading, brooming and rolling is eliminated.

Gravel Subbases and Soil Cement Bases—Specified density is obtained in one to three passes, depending on material and depth. Because the Roadpacker compacts equally well traveling forward or in reverse, there's no deadheading when two or more passes are needed. Vertical packing action prevents troublesome shoving on difficult materials and does not drift the spread down on super-elevations.



Widener Attachment—Vibrating shoes compact material in widening trench while Roadpacker runs on existing pavement. Easily adjusted for various width trenches.

ROADPACKER FEATURES

- **Low maintenance**—*Rugged vibrator shoes are pressure lubricated and actuated hydraulically through a completely sealed system. There are no exposed moving parts, no oil levels to check, no breather holes through which oil can escape.*
- **Fast and maneuverable**—*Highway speeds up to 28 mph, reverse speeds up to 7 mph. Steers easily. For work in tight places, can be operated with only four shoes. Shoes can be folded up easily and need not be removed from machine.*
- **Easy to operate**—*Operator is above dust, away from engine heat and exhaust for maximum comfort and efficiency. He has excellent visibility . . . controls are readily accessible.*

Get all the facts on the new Lima Roadpacker—write for your copy of the Roadpacker bulletin today.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA ROADPACKER

BALDWIN-LIMA-HAMILTON
Construction Equipment Division — LIMA WORKS

OTHER DIVISIONS: Austin-Western • Eddystone • Electronics & Instrumentation
Hamilton • Loewy-Hydropress • Madsen • Patton • Standard Steel Works

or even a pin hole in a hose line can literally ruin an engine in a short time.

When pre-cleaners are used, never allow the dust level to exceed the manufacturers' recommendations. Also be sure that the dirt accumulation in the bottom of the oil cup on air cleaners does not exceed ½ in. The filtering oil should be checked several times a day in dusty locations. A good rule to follow is to change the oil and wash out the cup whenever the oil becomes discolored. Use oil of the same viscosity as used in the crankcase, but do not use an oil that tends to foam.

The engine should draw the cleanest possible air. The dust concentration 3 or 4 ft above the engine hood is usually only a fraction of that at hood level. Especially on off-highway equipment, it is often necessary to provide an extension for the air cleaner so that the air intake will be out of the main dust stream.

Tires

Modern tires, especially those with nylon casings, are built to take more heat than their predecessors. But under-inflation is still dangerous in summer because it allows the tire side walls to flex, and this builds up excessive heat that can shorten tire life.

When running in hot weather, air pressure build-up is to be expected because of the normal heat expansion of the air in the tire. Air pressure should be checked daily but only when the tires are cool.

Air pressure increases of over 15 lb are considered excessive, but tire manufacturers warn against bleeding them on hot days. Excessive build-up is caused by overloading, high speeds, using the wrong size tire, or by under-inflation. Tire manufacturers strongly recommend that the speed or the load be reduced when excessive build-up occurs.

Prestressed Concrete

Reprints of CM&E's special report on Prestressed Concrete now are available. Single copies, 35¢; in orders of 10 copies or more, 25¢ each. Address your order to the editor, 330 W. 42nd St. New York.

mighty mobile muscles...

CHRYSLER INDUSTRIAL 32
(265 cu. in. displacement) powers the Crane Carrier Corp. carrier. Chrysler Industrial 30 (230 cu. in. displacement) powers the P & H Miti-Mite. Both are in-line 6 Engines used on many makes of equipment in the construction and materials handling field. There are four Chrysler in-line 6s, two V-8s—ranging from 230 to 354 cu. inch displacement.

Hard-hitting, fast-moving Chrysler-powered combination specially designed for a wide variety of "in-between" digging and lifting jobs. *P & H Miti-Mite* converts on the job to crane, shovel, dragline, trench hoe, clamshell, magnet crane. All transmission parts are encased in oil—work on anti-friction bearings. *Crane Carrier Corp.* carrier has rugged H-beam frame with all-welded construction. Both the *Miti-Mite* and the *Carrier* are powered by Chrysler for peak operating efficiency and minimum maintenance.

Chrysler
INDUSTRIAL ENGINES
INDUSTRIAL ENGINE DIVISION • CHRYSLER CORPORATION

Write Dept. F-5, Industrial Engine Division, Chrysler Corporation, Detroit 31, Michigan, or see your nearest Chrysler Industrial Engine Dealer.

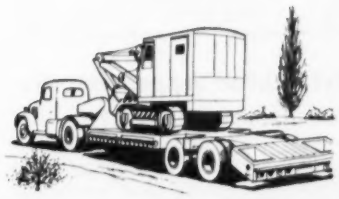
☐ For specific detailed information ☐ For descriptive literature

NAME
ADDRESS
CITY ZONE STATE

There's a Trailmobile Trailer for every

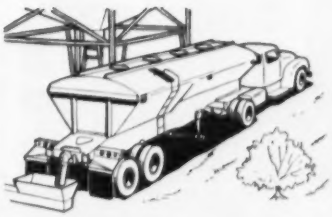
Trailmobile offers a single source of supply for every type of "heavy construction" trailer along with factory service facilities in 54 cities from coast to coast. Beyond this, many of Trailmobile's construction features were designed with time saving "on-site" maintenance in mind. All trailers are available on convenient financing up to five years for qualified buyers. For further information on new or used equipment, write Trailmobile Inc., 31st and Robertson, Cincinnati 9, Ohio.

highway construction need



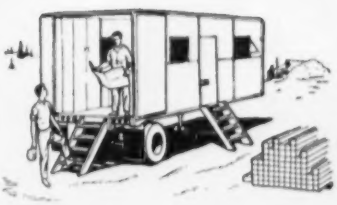
TRAILMOBILE LOW BEDS

. . . are used to deliver heavy road building equipment to the job area. Steel shovels, bull dozers and other large tractor-treaded units can be easily transported on these powerfully built trailers.



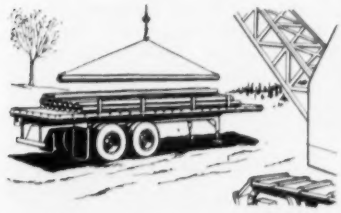
TRAILMOBILE CEMENT BULKERS

. . . transport large amounts of bulk cement to mixing plants at the job site. Both steel and aluminum types offer exclusive step-down design with twin screw discharge.



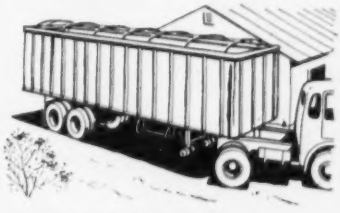
TRAILMOBILE FREIGHT VANS

. . . combine weather protection and mobility for hauling general supplies. Low cost used vans provide ideal job site offices, tool shops or storage facilities.



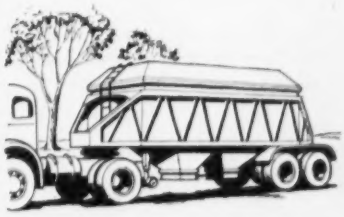
TRAILMOBILE PLATFORM TRAILERS

. . . are used for carrying lumber, cement forms, drainage tile, straw bales and sundry light equipment. "Sideless feature" permits simpler, faster loading and unloading.



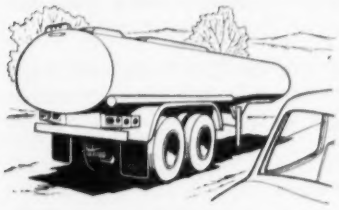
TRAILMOBILE OPEN TOPS

. . . are extensively used for carrying tools and construction materials. These units can be equipped with tarpaulin roof covers to protect contents against sun, rain or snow.



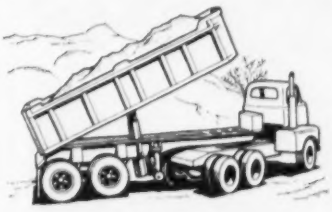
TRAILMOBILE HOPPER TRAILERS

. . . are used for carrying and spreading aggregate, gravel and sand. Bottom discharge permits uniform spreading of contents over a wide area.



TRAILMOBILE TANK TRAILERS

. . . are widely used for hauling hot asphalt, road oils, and the great volume of water required at the site. Most units carry a unique guarantee against tank leakage.



TRAILMOBILE HYDRAULIC DUMPS

. . . provide big capacity in a dump-type trailer for hauling and unloading sand and gravel. Unusually rugged construction guards against costly out-of-service time.

TRAILMOBILE INC.

Subsidiary of Pullman Inc.

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Sales and Service from Coast to Coast

TRAILMOBILE INC.
31st & Robertson
Cincinnati 9, Ohio

Please send me further information on the trailer types I have indicated below:

- ☐ Low Beds
- ☐ Platform Trailers
- ☐ Cement Bulkers
- ☐ Tank Trailers
- ☐ Freight Vans
- ☐ Hydraulic Dumps
- ☐ Open Tops
- ☐ Hopper Trailers

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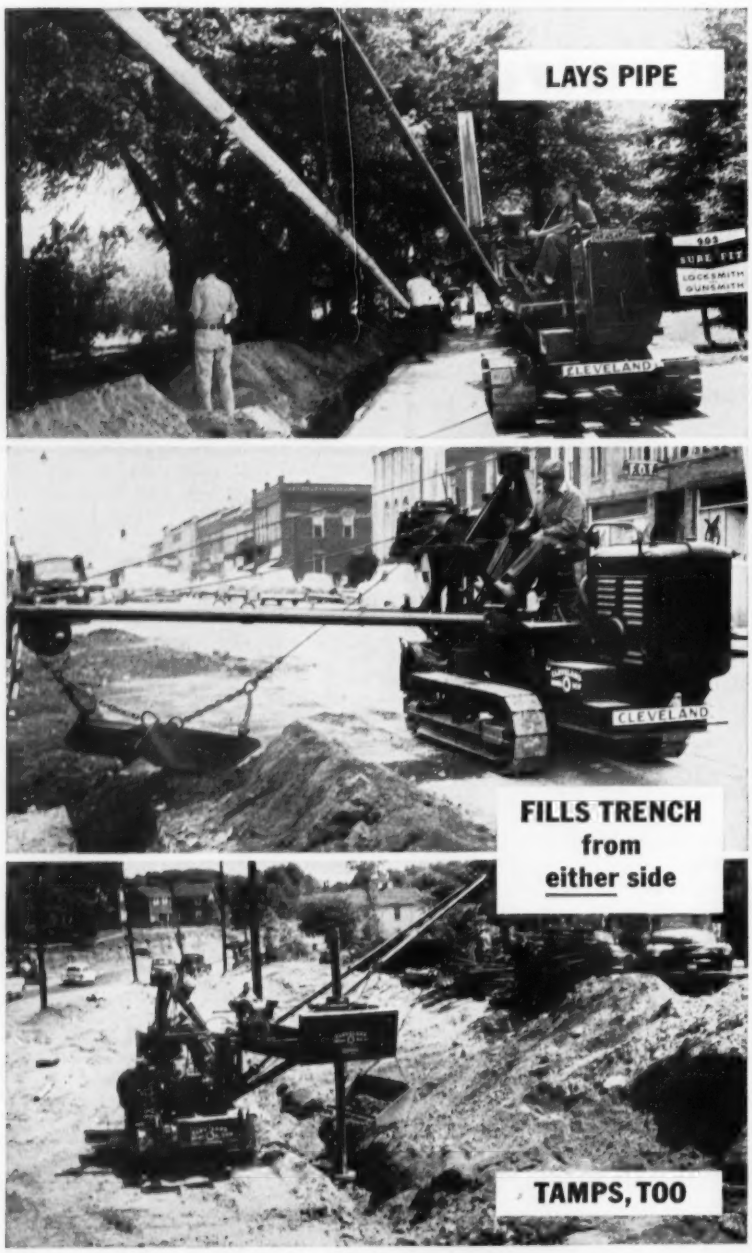
COMPANY_____

STREET_____

CITY_____ STATE_____

The Cleveland 80W ...a real money maker



Does All 3 Jobs Better...with Only 1 Man

THE CLEVELAND TRENCHER CO.

20100 ST. CLAIR AVENUE • CLEVELAND 17, OHIO

Good Everywhere

Sales and Service

Equipment purchasing and servicing takes less time when you know who and where to call. Keep advised of new distributors, sales personnel and other activities.

Distributor Appointments

Clark Equipment Co: Five new dealers have been appointed to sell and service the Michigan line of tractor-shovels and excavator cranes. Dealers and their territories are: Interstate Equipment and Supplies Co., Inc., Montpelier, Vt., for the state of Vermont; Graid Equipment Co., Reno, Nev., for the state of Nevada and several California counties; Cramer Machinery Co., Portland, Ore., for most of Oregon and parts of Washington; Equipment Inc., Jackson, Miss., for eight Mississippi counties; and Construction Equipment Co., Ltd., Winnipeg, for the entire province of Manitoba.

Parsons Co.: The Colorado Builders Supply Co., Denver, Colo., has been awarded an exclusive distributorship for Parsons products. Parsons, a division of the Koehring Co., produces crawler-mounted ladder and wheel-type trenching machines, the Trenchmobile, the recently introduced Big Incher and Middle Incher ditching machines for pipe-laying operations.

Joy Mfg. Co.: The Duckworth Supply Co., Inc., has been appointed a Joy distributor for the Port-Arthur-Orange area of Texas. Duckworth will handle Joy portable compressors, rock drills, pneumatic tools, and air, electric, and gasoline drive hoists.

Pioneer Engineering Works, Inc.: Flack Equipment Co., Dayton, Ohio, is the new distributor of Pioneer equipment in southwestern Ohio. Other recent Pioneer appointments include the Anderson Equipment Co., Inc., of Omaha, Neb., and the Llewellyn Machinery Corp. of Miami, Fla.

Euclid Div., GMC: Kyle Equipment Co. is the new authorized dealer for the complete Euclid line of earthmoving equipment in

continued on page 279

"No worries, no overhauls, with FULLER TRANSMISSIONS"...

Lewis & Frisinger

Lewis & Frisinger Co., General Contractors, Ann Arbor, Michigan, own 8 heavy-duty construction machines that are equipped with Fuller Transmissions *that have never had a single transmission overhaul.* Some of this equipment has been in active service 11 years.

Says Frank Frisinger, Equipment Superintendent: "Whenever and wherever we can specify the transmission, we specify Fuller. We're completely satisfied with them. I have no worries at all from Fuller Transmissions. They've always stood up under the most severe tests."

This 30-year old firm, one of the largest and oldest general contractors in Michigan, owns and operates a number of heavy-duty scrapers, rear end and bottom dump trucks. The Fuller Transmissions in this equipment range from 5-speed 5-F-1220's and 5-A-920's to 4-speed 4-A-112's. The gear ratios permit . . . selection of speeds best suited to the work at hand . . . smoother shifts . . . better control of loads and put more horsepower to work more efficiently.

That's why so many equipment manufacturers, so many owners, prefer Fuller Heavy-Duty Transmissions. Select *your* transmissions from Fuller's 110 models—both semi-automatic and full manual control. You'll find the transmission designed to do *your* job better at less cost.

where horsepower really goes to work

Fuller TRANSMISSIONS

FULLER MANUFACTURING COMPANY (Transmission Division), KALAMAZOO, MICHIGAN

Unit Drop Forge Div., Milwaukee 1, Wis. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Sales & Service, All Products, West. Dist. Branch, Oakland 6, Cal. and Southwest Dist. Office, Tulsa 3, Okla.

How a sand and gravel plant
SAVES UP TO $162 PER WEEK

Amsco® Semi-automatic S/A-53 Tube Rod... used in place of a competitive semi-automatic rod, is saving a large sand and gravel operator up to $162 per week on roll crusher hardfacing. And this is done with no loss of service life . . . no increase in welding time or rod consumption.

These roll crushers handle 3000 tons of gravel per week, work 10 days between hardfacings. Replacement rolls are hardfaced daily, using about 50 lbs. of rod.

You can make comparable savings by using Amsco S/A-53 Tube Rod in severe impact-abrasion service. S/A-53 is designed especially for use with Amsco MF Semi-automatic Welders, but other machines may be easily adapted to accommodate its $^3/_{32}$" diameter.

S/A-53 is a prehardened, pre-lubricated, high-chromium alloy rod . . . easy to weld on carbon or manganese steel. Deposits from 5 to 15 lbs./hr. according to current settings. Deposit hardness averages 425 to 475 Brinell.

Any Amsco Distributor will give you a chance to try S/A-53 in an Amsco MF Semi-automatic Welder. Why not take him up on it and test the savings yourself?

Write for Bulletin 656, describing S/A-53 and the complete Amsco "wear-fighter" welding line in detail. Address: Amsco Welding Products Department, Chicago Heights, Ill.

Amsco Welding Products distributed in Canada by Canadian Liquid Air Co., Ltd.

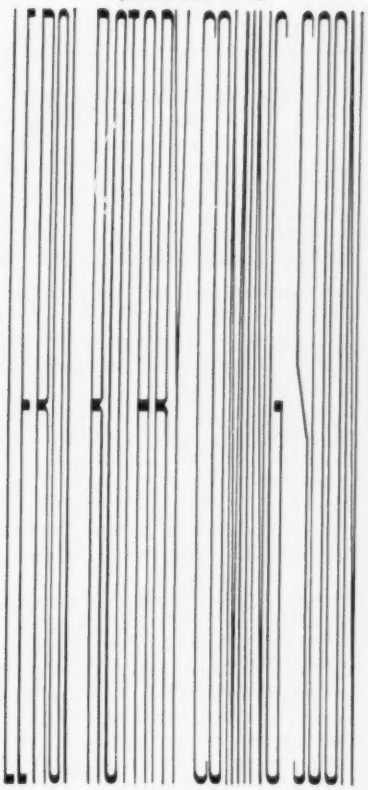
AMERICAN Brake Shoe COMPANY

AMSCO

American Manganese Steel Division • Chicago Heights, Ill.

OTHER PLANTS IN: DENVER, LOS ANGELES, NEW CASTLE, DEL., OAKLAND, CAL., ST. LOUIS, JOLIETTE, QUEBEC

(Advertisement)



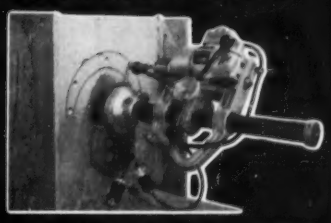
Hold paper nearly level with eye to read this message

ONLY

MAG-TOOL

HAS

MICROMATIC ADJUSTMENT



MAG-TOOL Drill Presses attach magnetically to ferrous surfaces bringing the capacity of heavy duty presses right to the job!

MICROMATIC ADJUSTMENT enables movement of the drill for precise positioning *after* the press has been attached to the working surface. For example: (see photo) the bit may be easily positioned anywhere between the two curved lines without moving the drill press.
Inquiries invited.

MAGNETIC
TOOL CORPORATION

1955 Lafayette St. Santa Clara, Calif.

SALES AND SERVICE...
continued

southern California. Kyle has purchased the Southern California assets of George M. Philpott Co, former dealer for the area. The territory consists of the counties south of and including Kern, San Bernardino and San Luis Obispo. The George M. Philpott Co. will continue to represent Euclid in the northern part of the state.

On the Sales Front

Gar Wood Industries, Inc.: Ross Miller, who has been with Gar Wood since 1920, is the new sales manager for Gar Wood-St. Paul dump truck bodies and hoists. The announcement was made by Milton G. Peck, Gar Wood Industries' vice president and director of sales.

Shovel Supply Co.: A. E. Kramer is the new district representative in the Central - Midwest states. Kramer was formerly associated with Machinery, Inc., of St. Louis and Springfield, Ill. His headquarters will be at Springfield. Shovel Supply Co. manufactures tamping, rubber-tired, and flat-wheel rollers of various types in sizes ranging from two to 200 tons.

Yale & Towne Mfg. Co.: William H. McManus and Roger R. Reynolds have been named district sales managers for hoisting equipment produced by the Yale materials handling div. McManus, who will make his headquarters in Boston, will handle the New England sales district. Reynolds will service the Texas, Oklahoma, and Louisiana territory. L. Patrick McGauley will be sales representative at a newly-opened district office in New Orleans.

Jaeger Machine Co.: C. E. Anderson has been named sales manager of Jaeger's paving equipment division, it was announced by J. D. Anderson, general sales manager. Anderson, whose headquarters are in Columbus, has been affiliated with Brown & Root Co. of Houston, and George M. Brewster & Son of Bogota, N. J.

Thew Shovel Co.: George E. Gunther, formerly assistant sales manager, has been appointed sales manager of shovel and crane products. Gunther assumes full responsibility for the supervision of Thew's district sales managers and the direction of sales activities

Neenah
FOUNDRY COMPANY

construction castings

of sound quality... solid value

Patterns for
15,000 different Gray Iron Castings for
• Highway • Building • Communication
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"INFERNO"®

. . . The STEAM HOSE That Puts the Profit in Pile Driving

Famous for Durability and Safety!

Contractors know that when they put "Inferno" on the pile-driving rig, the job will keep going at a steady, profitable pace, with no question of bursting and its costly consequences. Record speeds and depths of drive have been made many times with this extra-strong, extra-durable steam hose . . . easily identified by the Goodall "Cloverleaf", and a black spiral stripe on the familiar red cover.

"INFERNO" STEAM HOSE specifications include high-temperature tube; multiple-layer, braided steel wire carcass; wear-and weather-resistant "Synplastic"® cover. Sizes ½" to 3", inclusive, in maximum lengths of 50 feet.

"If it's GOODALL it MUST be Good!"®

Contact Our Nearest Branch for Details and Prices

Standard of Quality—Since 1870

HOSE · BELTING · FOOTWEAR · CLOTHING AND OTHER INDUSTRIAL RUBBER PRODUCTS

GOODALL Rubber Company

GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.

BRANCHES AND DISTRIBUTORS THROUGHOUT THE UNITED STATES. IN CANADA: GOODALL RUBBER CO. OF CANADA LTD., TORONTO.

with domestic distributors. Other recent Thew sales appointments include Wilson H. Hadden as sales manager of special products and Quincy J. Winsor as sales technical manager.

In the Main Office

International Harvester Co.: Clarence A. Hubert, formerly manager of engineering of the farm tractor division, has been named general manager of the company's construction equipment division. The announcement was made by P. V. Moulder, president. Hubert was appointed assistant manager of engineering of the farm tractor division in 1945 and was named manager of engineering in 1946.

Standard Steel Corp.: Edward J. Meier has been named to the newly created post of advertising manager, according to Robert S. Burns, president. Meier, who joined Standard Steel last September as director of public relations, was formerly a New York editorial executive. A native of Grosse Pointe, Mich., he was also associated with the American Cyanamid Co.

Universal Atlas Cement Co.: James H. Neelan is the new assistant director of advertising and public relations for Universal Atlas Cement Co., a subsidiary of the U.S. Steel Corp. He succeeds Edwin R. Ivy. Neelan was formerly on the advertising staff of U.S. Plywood Corp.

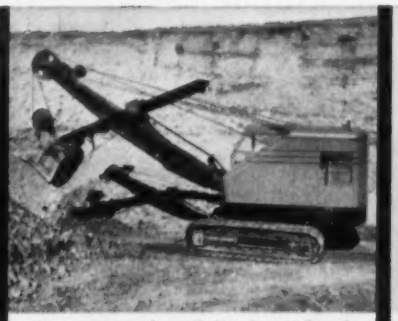
Special Mention

E. H. Wachs Co.: Harold B. Smith, president of the Illinois Tool Works, Chicago, has announced the sale of the company's power saw blade division to the E. H. Wachs Co. Wachs, observing its 75th birthday, is the manufacturer of the Guillotine saw, a portable metal cutting saw used extensively for pipe cutting.

Broderick & Bascom Rope Co.: A new branch and warehouse have been opened by the manufacturers of Yellow Strand wire rope at Atlanta, Ga. C. H. Kelly has been appointed manager of the new branch. The branch will also stock Altco logging tools, manufactured by American Logging Tool Corp., a subsidiary.

P&H DIESEL ENGINES

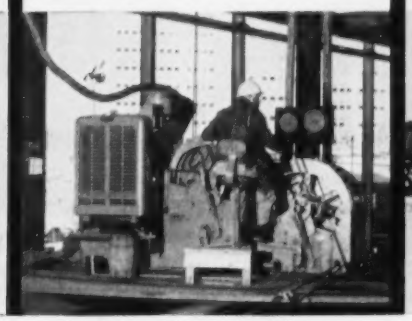
Powered by a 3 cyl. P&H Industrial Diesel



Powered by a 6 cyl. P&H Industrial Diesel

Powered by a 3 cyl. P&H Industrial Diesel

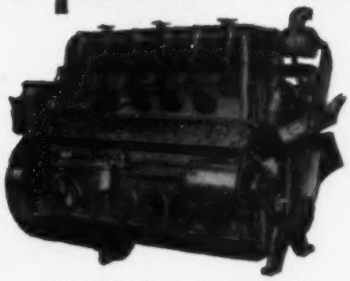
Powered by a 3 cyl. P&H Automotive Diesel



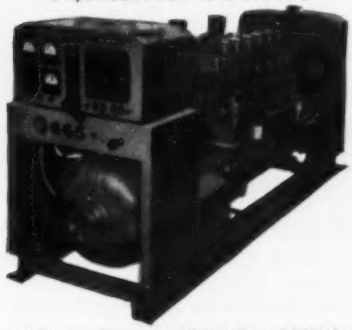
Hoist powered by a 3 cyl. P&H torque converter unit

Powered by a 6 cyl. P&H Industrial Diesel

A-1 power for A-1 construction work



P&H Industrial Diesel 2, 3, 4, and 6 cyl. models from 40 to 280 H.P.



P&H Diesel Generating Sets 20 to 125KW—AC and DC For independent electric motor driven equipment.

Equipment powered with the P&H Diesel functions smoother, faster and more efficiently with less down-time for restarts, servicing and repairs. This means a better job done faster—more production at greater profit to the owner.

Check these profitable performance features of the P&H Diesel:

- **More Power**
- **Faster Starting**
- **Better Idling**
- **Higher Torque**
- **Better Governor Control**
- **Greater reserve strength**

Efficiency and simplicity of P&H Diesel design assure lowest operating and maintenance costs. The P&H Diesel operates best on low cost No. 2 fuel oil. It has 25% fewer parts and all wearing parts are completely interchangeable.

Specify the P&H Diesel for your construction equipment. For additional information see your P&H dealer or write for Bulletin Z-26.

HARNISCHFEGER

P&H **Diesel Engine Division • Crystal Lake, Illinois**

Construction Equipment News . . .

New Model of Popular Finisher

The latest version of the Barber-Greene finisher, model 879-B, embodies four improvements that give it increased horsepower and faster laying and travel speeds. These include a new power plant; a 12-speed transmission that gives a top operating speed of 64 fpm and a top travel speed of 3¾ mph; a high-speed tamper; and a new crawler design.—**Barber-Greene Co., Aurora, Ill.**

This Truck Mixer Plant Is

Erie Strayer's Port-O-Matic truck mixer plant can be set up or taken down in 6 or 8 hr. The plant breaks down into four sections, and electrical connections are of the quickly disconnected plug and

Backhoe Digs Flush Footings

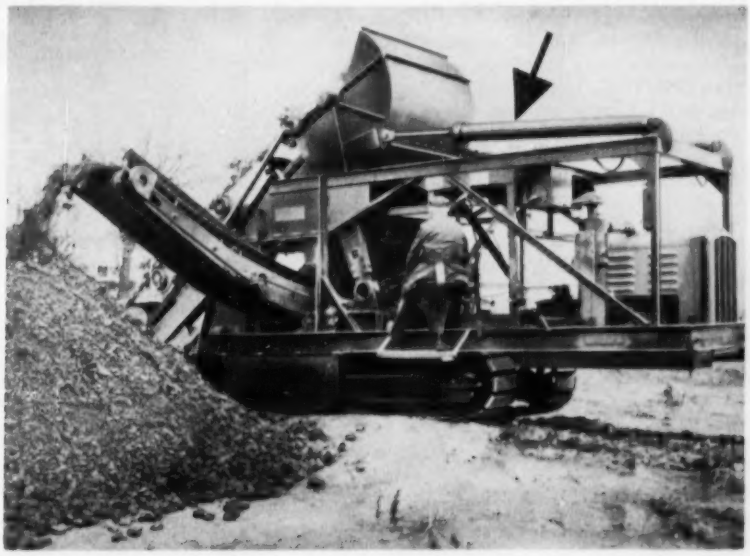
The mast and boom assembly of the new Davis backhoe can be moved from the center to either side of the frame for digging along-side obstacles. To dump the load clear, the boom swings smoothly through a 200 deg arc. Maximum digging depth is 13 ft.—**Mid-Western Industries, Inc., Wichita 15, Kan.**

Forms for Casting Tetrapods

Blaw-Knox now offers forms for casting tetrapods for breakwater jobs. They come in two sections closed with hinged bulkheads. When tetrapods are used, less volume is said to be required, and they are easier to handle and place than armor stone.—**Blaw-Knox Co., 300 6th Ave., Pittsburgh 22, Pa.**

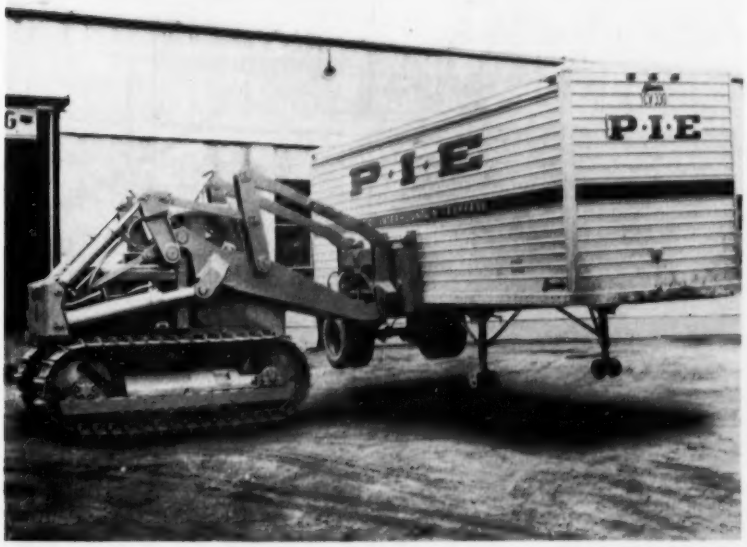
Easy to Set Up

socket type. All bin compartments are located in a single 100-yd unit from which material is automatically weighed. Capacity of the plant is said to be up to 160 yph. **—Erie Strayer Co., Erie, Pa.**



Ditcher Gets Hydraulic Controls

Gar Wood has equipped its model 160 ladder-type ditcher with hydraulic controls. The boom is raised, lowered, and held by an independent, package-type hydraulic control system and no friction boom clutches or brakes are used. Double-acting hydraulic cylinders provide full crowd for the boom. The 160 digs to 16 ft deep and 18 to 48 in. wide.**—Gar Wood Industries, Inc., Wayne, Mich.**



Fork Lift For Eimco Crawler

Eimco has introduced a new fork lift attachment that can be hydraulically tilted and leveled. The fork lift is designed as an attachment for the 143-hp Eimco 105 crawler tractor and it is easily interchangeable with the front-end loader. The lift can raise 15,000 lb to 14 ft. Lift tines are movable to fit various bin or pallet widths.**—Eimco Corp., 634 S. 4th W., Salt Lake City, Utah.**

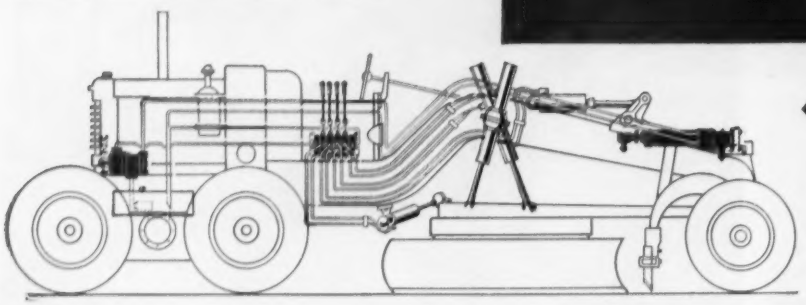
Grinds Ceilings

With the new CG ceiling grinder, an operator can finish up to 4,000 sq ft a day of concrete ceilings from 8 to 10 ft high, according to the manufacturer. The machine is designed to handle finishing

"Nobody puts a fine painting in a dime-store frame." When you see a piece of construction equipment with Vickers Hydraulics, you know it is a "quality" machine throughout.

Vickers provides all the inherent advantages of hydraulics and MUCH MORE: (1) the benefits of a nation-wide and full-time field engineering and service organization of unequalled experience; (2) a complete line of equipment enables Vickers to take UNDIVIDED system responsibility thus eliminating any risk of incompatibility of hydraulic components; (3) a hydraulics school for free training of customers' maintenance personnel. For further information, ask for Bulletin M5101A.

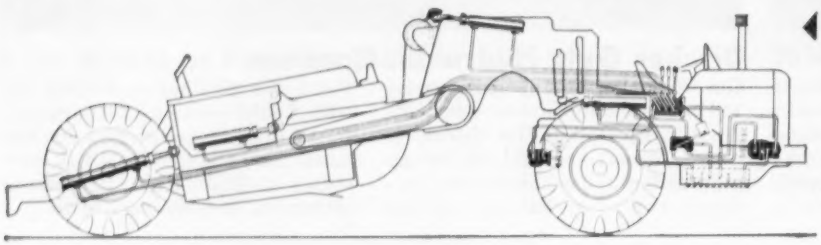
VICKERS® HYDRAULICS *means* "QUALITY" CONSTRUCTION EQUIPMENT



Motor grader uses Vickers Hydraulics for:

- maximum blade utility
- accurate and effortless tool adjustment
- positioning scarifier
- convenience of control to operator

Hydraulic motor (not shown) rotates blade on circle. Hydraulic power steering is separate circuit. Central hydraulic system is applicable.



Scraper has VARIABLE rate hydraulic power steering provided by:

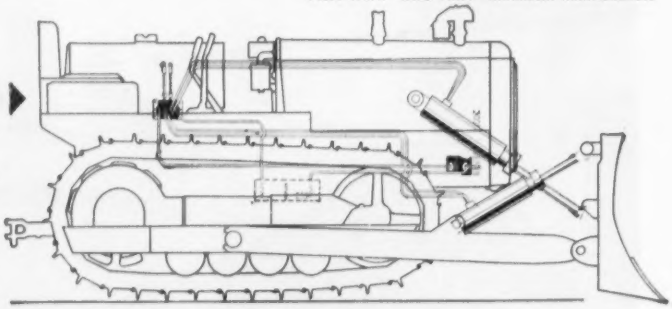
- Vickers Double Vane Pump
- Vickers Metering Control Valve
- Vickers Circuit-Splitting Unloading System
- Vickers Overload Relief Protection

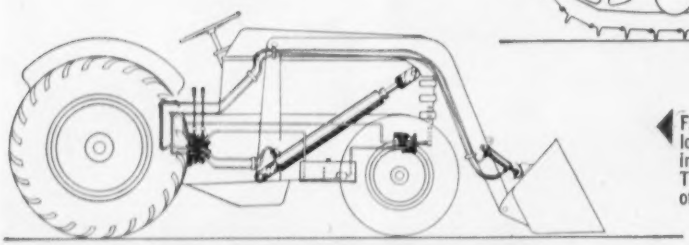
Vickers Single Vane Pump supplies power for:

- Fast actuation of bowl
- Fast apron manipulation
- Fast—Positive ejector action

More Work—Less Time—Minimum Maintenance.

Vickers Hydraulics provides fast lifting and angling of bulldozer blade along with exclusive "feathering" ability. Additional tractor attachments added later can be hydraulically controlled by simply adding sections to existing control valve thus eliminating necessity of mounting separate valves.





Fast, easy and dependable operation of front end loader utilizes Vickers Balanced Vane Pump (with inherent automatic wear compensation) and Vickers Two-Section Directional Control Valve. Note simplicity of installation.

Write for bulletin M5101A it discusses the MANY BENEFITS you get from VICKERS HYDRAULICS

VICKERS INCORPORATED
DIVISION OF SPERRY RAND CORPORATION
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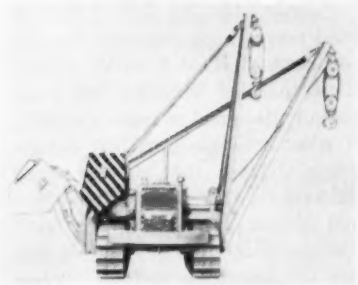
7752

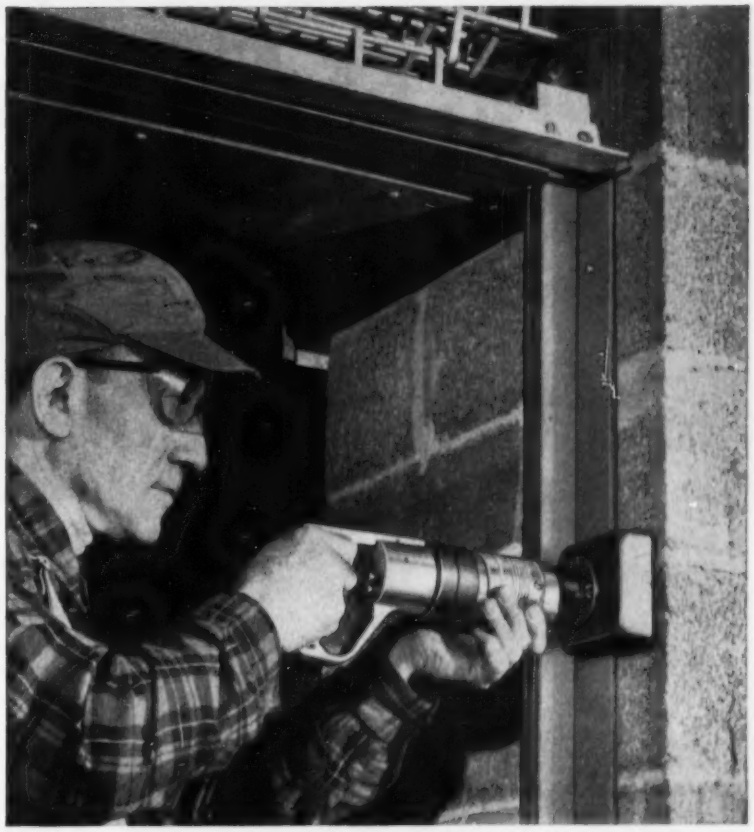
ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

on large jobs such as concrete apartment buildings. The grinding is done by a 9-in. fibre-backed disc driven by a ½-in.x8-ft long flexible tool shaft. The shaft is powered by a ¾-hp enclosed motor. Grinding is done with the disc perfectly flat against the ceiling and running at 3450 rpm. To remove nails or fins, it can be set at a slight angle. To raise the height of the grinding wheel the operator lifts up on the handle and a ratchet arrangement automatically locks the disc in position. Pressure is put on the grinding wheel by the spring and chain arrangement at the opposite end of the pivot arm. A turnbuckle adjusts the grinding disc to the flat position. A spring built into the bearing housing supports the grinding disc and absorbs any shock.—**Stow Mfg. Co., 31 Shear St., Binghamton, N.Y.**



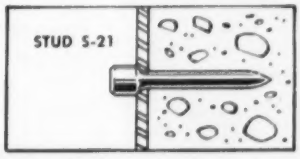
NEW CAT PIPELAYER—Caterpillar's No. 572 Pipelayer provides up to 86,000 lb of lifting capacity at a 4-ft overhang. An 86-in. wide track gage and a new counterweight design are said to give the medium-sized rig superior stability when handling big loads. Power for the No. 572 tractor is developed by a four-cylinder Caterpillar diesel engine rated at 128 hp at 1200 rpm. The engine transmits power to a three-stage torque converter that is coupled with a special low-speed transmission. The transmission, which has three forward and two reverse speeds, is engineered to provide the slow travel necessary for pipelaying work. The counterweight design is new on Caterpillar equipment. To increase stability under load, the weights extend in line, but retract over the tracks when the hook is not loaded. As the hydraulically actuated counterweights extend, they pivot outward from the base. When partially extended, the effective mass weight rotates upward from a second point, which is de-

Just one of *101* Stud Driver uses!



No outside power source required—

Anchor metal door frames to concrete or cinder block in seconds with the Remington Stud Driver



¼" **Remington S-21 Stud** with 22 caliber Power Load is recommended for the application above . . . no pre-drilling required. There's a special stud to fit your needs, a Power Load to handle the job.

There's no time lost with this cartridge-powered fastening tool! It sets ¼" or ¾" diameter studs in concrete or steel . . . up to *six* a minute, either size. Barrel change-over takes only 90 seconds *right on the job.* Over 40 Remington Studs to choose from, plus 22 and 32 caliber Power Loads scientifically graded to furnish *exact* power you need. Cuts costs, saves time on light, medium or heavy-duty fastenings!

FREE BOOKLET tells how and where to use the Stud Driver. Clip and mail coupon today for your copy.

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Please send me your free booklet which shows how I can speed the job and save with the Stud Driver.

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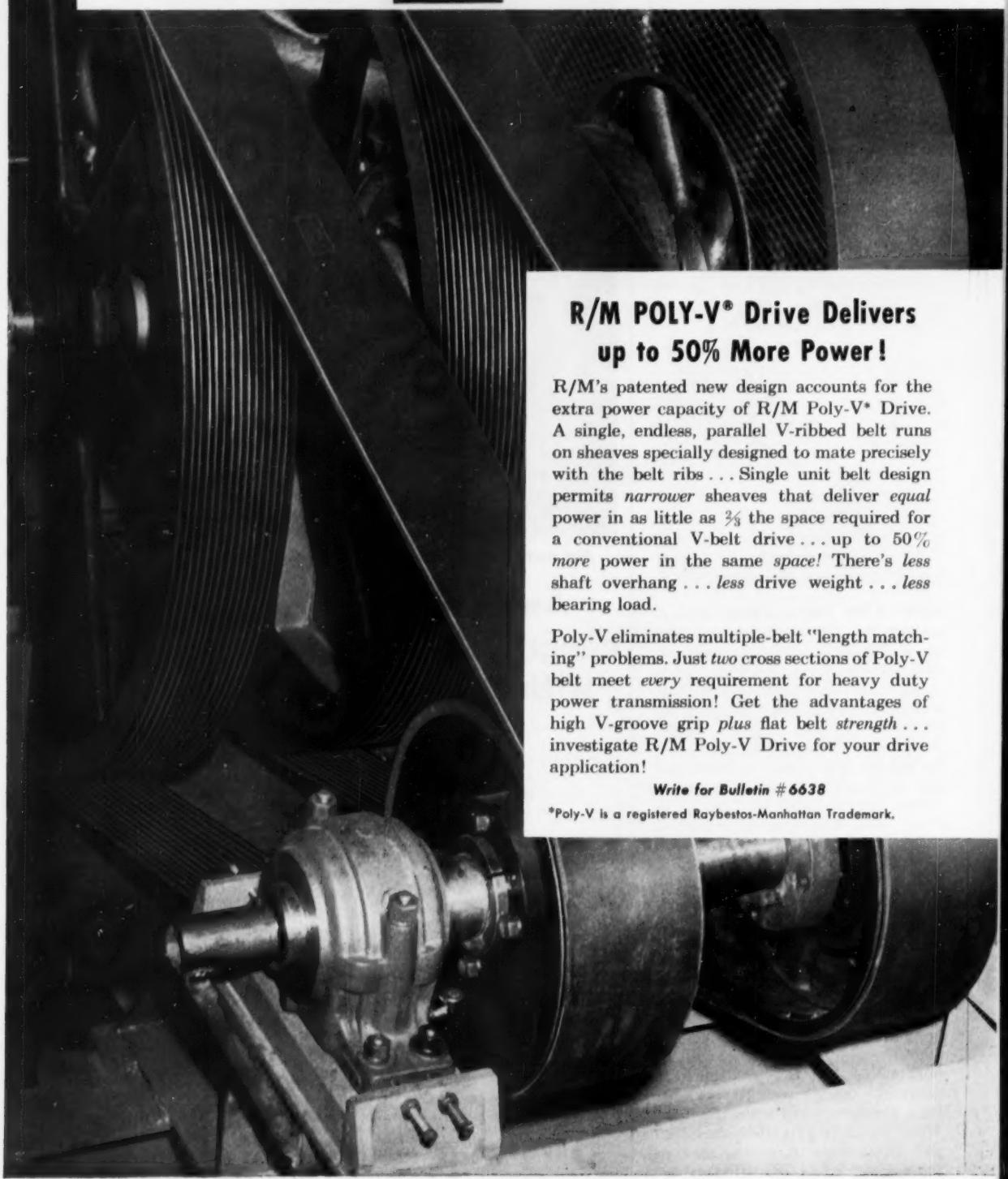
Users Say R/M BELTS AND HOSE



R/M POLY-V® Drive Delivers up to 50% More Power!

R/M's patented new design accounts for the extra power capacity of R/M Poly-V* Drive. A single, endless, parallel V-ribbed belt runs on sheaves specially designed to mate precisely with the belt ribs . . . Single unit belt design permits *narrower* sheaves that deliver *equal* power in as little as ⅔ the space required for a conventional V-belt drive . . . up to 50% *more* power in the same *space!* There's *less* shaft overhang . . . *less* drive weight . . . *less* bearing load.

Poly-V eliminates multiple-belt "length matching" problems. Just *two* cross sections of Poly-V belt meet *every* requirement for heavy duty power transmission! Get the advantages of high V-groove grip *plus* flat belt *strength* . . . investigate R/M Poly-V Drive for your drive application!

Write for Bulletin #6638

*Poly-V is a registered Raybestos-Manhattan Trademark.

Give You "*More Use per Dollar*"

HOMOFLEX HOSE Handles Easiest Where Going is *Rough!*

Light in weight and "flexible as a rope" . . . strong enough to take a real beating on the job! Homoflex Hose is R/M's easy handling construction for use with air, water, other fluids and gases. No pre-set twist . . . it coils and uncoils in *any* direction—*without* kinking. Homogeneous cover, strength member and tube are virtually inseparable. Uniform inside and outside diameters make it easier to couple. Homoflex Hose gets more work done and lasts longer . . . gives you "More Use per Dollar."

Write for Bulletin #6879

RAY-MAN CONVEYOR BELT *Cuts Handling Costs!*

Cushioned strength members . . . *Double* compensation in top and bottom outer plies relieves stress in troughing, rounding pulleys and in reverse bends. Strength *plus* flexibility permits bigger loads, longer life . . . "More Use per Dollar." Ray-Man requires no breaker strip . . . resists ripping . . . *holds* fasteners . . . is mildew-proof and moisture resistant. Exclusive "XDC" Cover adds *extra* protection against wear, tears, cuts and abrasion. Other R/M feature conveyor belts include Homocord for abusive shock loading . . . R/M Tension-Master for extra long lifts, high tensions.

Write for Bulletin #6915

For the "Smoothest Running V-Belts Made," Specify CONDOR and R/M SUPER-POWER V-BELTS

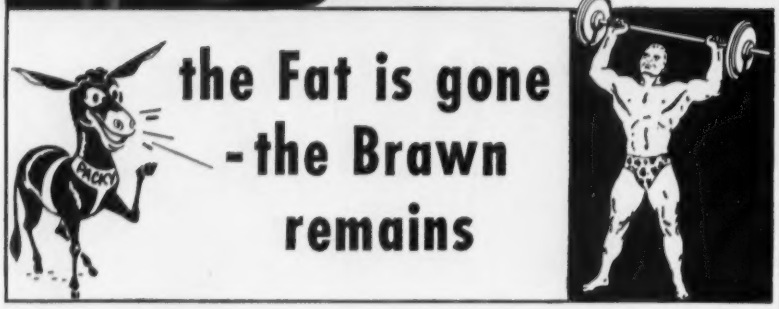
RM-709

BELTS • HOSE • ROLL COVERINGS • TANK LININGS • INDUSTRIAL RUBBER SPECIALTIES

MANHATTAN RUBBER DIVISION—PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

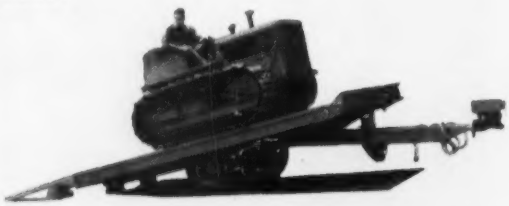
Other R/M products: Abrasive and Diamond Wheels • Brake Blocks and Linings • Clutch Facings • Asbestos Textiles • Mechanical Packings • Engineered Plastics • Sintered Metal Products • Industrial Adhesives • Laundry Pads and Covers • Bowling Balls



Judicious use of alloy steel, to produce a lightweight trailer with more than adequate strength is a Rogers accomplishment in the popular LT Model.

Attractively priced, it meets the demand for more payload per pound of trailer weight.

Available in 15, 20, 25, 30 and 35 ton capacities; it is similar in general design and equipment to Rogers standard models.



*One of several Rogers *TILT-DECK Rogers trailers.*

*Trademark Registered

Experience Builds 'em ROGERS Passenger Trailers Performance Sells 'em

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TRAILERS

ROGERS BROS. CORP. ALBION, PENNA.

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signed to give increased leverage so that higher lift capacity can be obtained with less counterweight. Boom and load lines are under constant full power at all times when the engine is running. Power for the winches comes from a power take-off from the engine that is independent of the torque converter or flywheel clutch. Safety features include self-energizing, weather-protected 22x5-in. contracting band brakes; a boom drum with ratchet teeth that can be engaged by a pawl to prevent accidental dropping of the boom; and a spring-loaded boom brake. The boom uses an automatic kickout that releases the power take-off clutch as the boom reaches its maximum vertical position. This is said to reduce the possibility of boom and cable damage. The closed hydraulic system for the pipelayer mechanism includes Cat's No. 46 hydraulic control.—**Caterpillar Tractor Co., Peoria, Ill.**

KEEPS MEN DRY—Standard Oiled Clothing Co. has introduced a new waterproof suit for construction workers that is said to resist abrasion, snags and tears. The new clothing, which is made of heavy-duty neoprene, is said to resist oils, grease, tars, and most acids. The clothing is available in various styles to suit most working conditions.—**Standard Oiled Clothing Co., 810 E. 152nd St., New York, N.Y.**

continued on page 290

GENERAL NYGEN® TIRES

SPEED UP MOVING 6-MILLION YDS. OF DIRT FOR ALLEGHENY CONTRACTING INDUSTRIES ON HUGE $153-MILLION INDUSTRIAL DEVELOPMENT!

H.C.T. LOGGER

TRACTOR GRADER

ALL DUTY L.C.M.

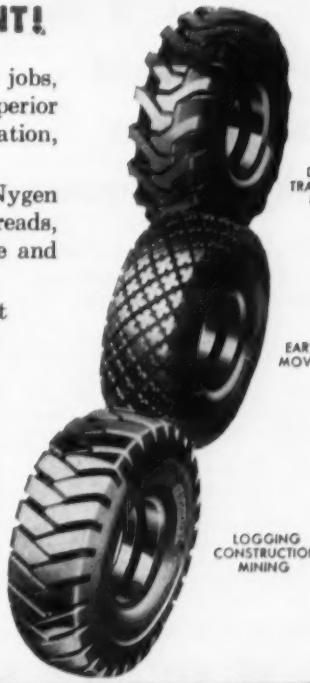
Here, as on thousands of other construction jobs, General Nygen Tires are proving that superior strength *plus* crawler-like traction and flotation, gets the job done faster and *for less!*

Built with exclusive stronger-than-steel Nygen Cord and featuring extra wide, extra deep treads, Generals are unequalled for deep-down drive and dependability.

Hand General Nygen Tires your toughest assignment today and watch them save time . . . build profits!

THE GENERAL TRUCK TIRE

specify GENERALS *on your new equipment*



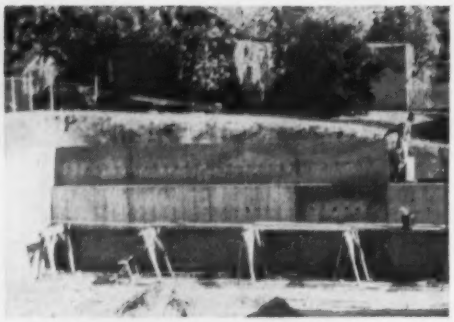
DUAL TRACTION LUG

EARTH MOVER

LOGGING CONSTRUCTION MINING

THE GENERAL TIRE & RUBBER CO. • Akron, Ohio

New Gates "pre-stressed" tie used on 12-foot retaining wall



The new Gates pre-stressed form ties were used with the Gates Commercial Forming System to form this 12-foot high retaining wall for a Denver, Colorado, apartment building. The 12' wall was poured in three, 4-foot lifts using full 4' x 8' plywood sheets for the forming. The contractor, Von Construction Company of Denver, reports the new tie provided an exceptionally true and uniform wall, with a big saving in forming and stripping time and a maximum number of re-uses from the forms.

There's a research-engineered Gates System for any job... large or small.

USE GATES
IT'S GALVANIZED

For additional information on your next job, clip this ad to your letterhead and mail to:

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CM 5/57

Onan ELECTRIC PLANTS

ELECTRIC PLANT NEWS

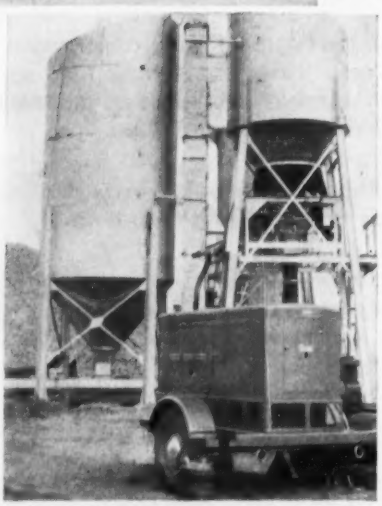
Onan ELECTRIC PLANTS

On-site cement plant operates with Onan power

35KW Onan Electric Plant powers 15 H.P., 5 H.P. and two 2 H.P. motors, vibrator, controls, welder and lights

It's a completely electrified operation . . . even to electric lights in the mobile office nearby . . . yet this bulk cement plant is far distant from the utility highline. The Onan heavy-duty, water-cooled electric plant runs continuously during working hours with a minimum of servicing. It has the capacity to provide electricity for miscellaneous lights, tools, motors and communications, too.

Other A.C. models: 500 to 75,000 watts. Also D.C. and battery charging units.



Series 35ED Onan Plant, powered by 8-cylinder gasoline engine, provides all the electricity needed. Trailer mounted, it is easily moved from site to site. Weatherproof housing.

See your Onan distributor or write for literature

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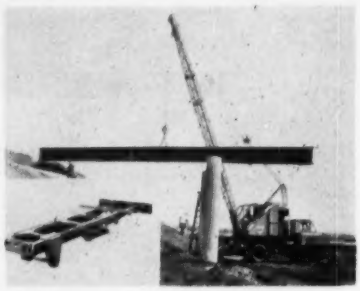
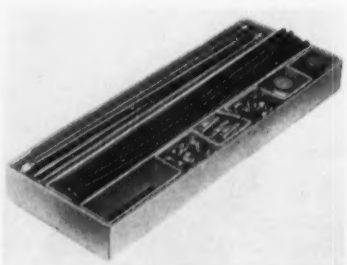
Onan ELECTRIC PLANTS



EIGHT-TON BANTAM—Schield Bantam Co. has increased the lifting capacity of its crane carrier-mounted Model T-35 to eight tons. The increase is the result of several modifications made to the former 7-ton model. When mounted on the Bantam 300 carrier, the T-35 will handle an 8-ton load working at a 10-ft radius (over-end with outriggers). Modifications to the T-35 include a new four-part hoist line and hook block; 1250 lb of additional counterweight; hardened pins and bolts at stress points in the boom and gantry assembly; flame-hardened trunnion rollers, and a strengthened trunnion base. Schield Bantam has also introduced a new box-beam-type frame for its 300 crane carrier (insert). The design is said to give the frame greater strength and rigidity. Each side rail of the frame is made of two pieces of ⅜x11-in. formed channel welded together with one continuous automatic weld. The Bantam 300 crane carrier offers six-wheel drive and it is powered by a 302-cu in. GMC gasoline engine.—**Schield Bantam Co., Waverly, Iowa.**



EXTENDS TIRE VALVES—A new oversize tire valve extension kit, designed principally for users of off-the-road vehicles, contains all materials required to make valve extensions in any length up to 24¾-in. The kit includes 10 lengths of tubing with ends attached; 10 lengths of woven loom; 10 extension ends for valve cores; 10 jam nuts with lead seats; 20

For fast, low cost liquid asphalt deliveries . . .

NEW DESIGN
Butler asphalt transports

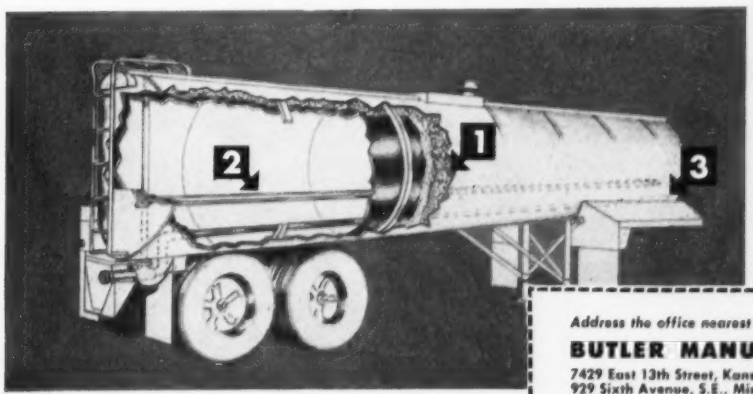
New design 6075-gallon Butler Asphalt Transport for use in Illinois. Butler has made asphalt transports as large as 6500 gallons for areas with high gross weight limits.

Here's an all-new asphalt transport that gives important savings in time and money to operators of asphalt plants and road contractors alike!

NEW payload power—A new design by Butler, manufacturer of a complete line of high capacity liquid transports, makes this transport as much as 3,000 lbs. lighter than most units only three years old. This means hundreds of gallons more legal payload per haul, fewer miles to drive to make deliveries, less investment in extra rigs.

NEW handling ease—Handling and backing are easier because of the new round shape of the tank which gives better visibility to the rear.

NEW low-maintenance construction — Maintenance, cleaning and fast drainage are simplified by the clean bore design of the tank. Strengthening rings located *outside* the inner shell make the tank stronger, yet lighter. Glass fiber insulation covers the entire inner shell and maintains the asphalt at liquid temperatures during long hauls.



Optional Features to Fit Butler Asphalt Transports to Your Operations

1. Steel or high payload aluminum jackets
2. Fire tubes or steam coils inside tank
3. Discharge at front for tractor-mounted pumps

Choice of cylindrical, conical or drop section shape

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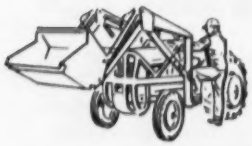
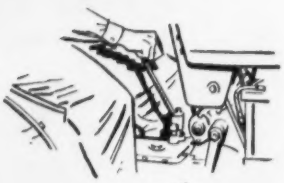
Time the cycle, compare the price...see how FORD GIVES YOU MORE!



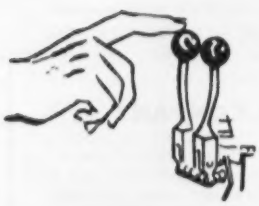
Easy, Step-On Design

Ford Loader leaves side of tractor open. Wide, low step-plate enables operator to move quickly, safely, and easily into seat, with no climbing. Plenty of elbow room, good visibility.



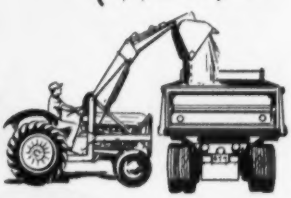
Fast, Smooth Shifting

Ford's vertical-type shift lets you change from gear to gear quickly, smoothly. Just nudge the lever to shift from forward to reverse on "back and forth" loading applications.



Instant Hydraulic Control

Simple controls, only a finger's reach away from the steering wheel, provide full, instant control of loader and bucket. Tractor hydraulic system is free for use with rear-mounted equipment.



Greater Reach and Lift

Ford Industrial Loader provides 10' 10" lift from ground to bucket bottom . . . 26" reach at full lift. Load entire truck from one side. Spill-guard on bucket protects operator from falling material.

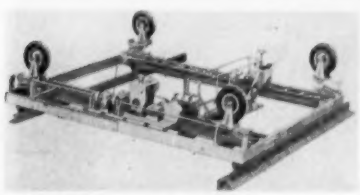
Find out how a yard-a-minute Ford Tractor-Loader can handle your jobs for less. See your Ford Tractor and Equipment dealer, or write to: Tractor and Implement Division, Ford Motor Company, Birmingham, Michigan.

Ford
TRACTORS AND INDUSTRIAL EQUIPMENT

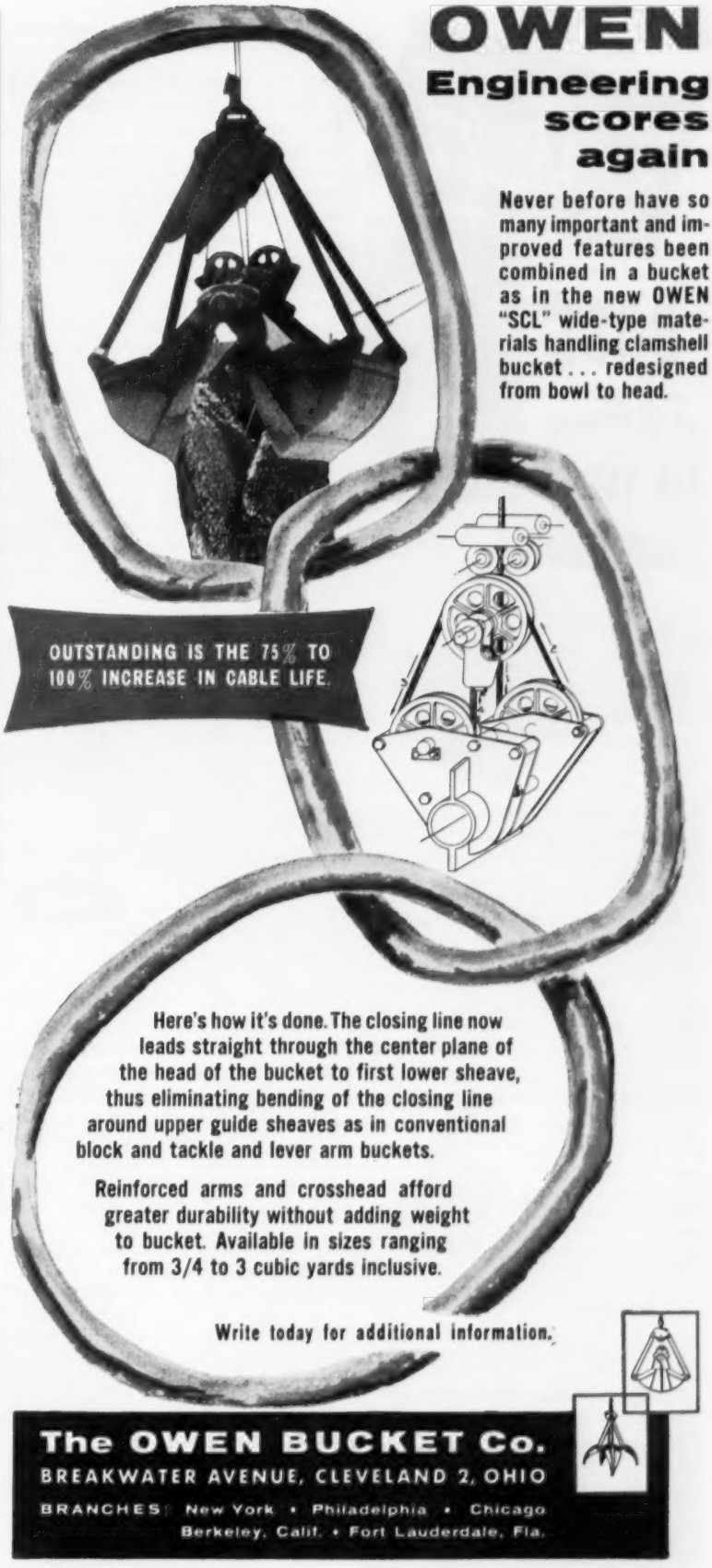
You see more **FORDS** *because they save more money!*

lock nuts; 12 silver solder rings; a bottle of silver solder flux; and complete instructions. The extensions can be bent by hand to any angle desired, yet they will not distort when torque is applied to their ends, according to the manufacturer. Jam nuts are used on the extensions to lock the valve stem mouth to the extension.—**Dill Mfg. Co., 700 E. 82nd St., Cleveland 3, Ohio.**

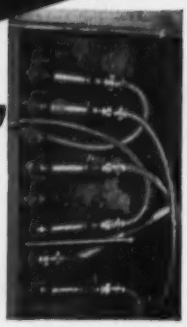
CARBIDE INSERT BITS—A new line of rock bits with Tungsten carbide inserts, made to fit directly on type 600 and 1000 series steels, has been introduced by Vascoloy-Ramet. Designed with the inserts mounted in an "X" formation, the bits feature five-hole construction and a wide chip channel design for fast removal of large chips. The carbide inserts are positioned in an alloy steel body that is triple tempered by a special heat treating process. Style 600 bits are available in 3, 3¼, 3½, 3¾, 4, and 4½-in. dia. Style 1000 bits are available in 4, 4½, and 5-in. dia. —**Vascoloy-Ramet, Waukegan, Ill.**



REX FINISHERS—A new line of Rex Longitudinal Float concrete finishing machines are available in working widths from 10 to 32 ft. They are produced by the General Road Machines Div. of the Chain


OWEN
Engineering scores again
Never before have so many important and improved features been combined in a bucket as in the new OWEN "SCL" wide-type materials handling clamshell bucket . . . redesigned from bowl to head.
OUTSTANDING IS THE 75% TO 100% INCREASE IN CABLE LIFE.
Here's how it's done. The closing line now leads straight through the center plane of the head of the bucket to first lower sheave, thus eliminating bending of the closing line around upper guide sheaves as in conventional block and tackle and lever arm buckets.
Reinforced arms and crosshead afford greater durability without adding weight to bucket. Available in sizes ranging from 3/4 to 3 cubic yards inclusive.
Write today for additional information.
The OWEN BUCKET Co.
BREAKWATER AVENUE, CLEVELAND 2, OHIO
BRANCHES: New York • Philadelphia • Chicago
Berkeley, Calif. • Fort Lauderdale, Fla.

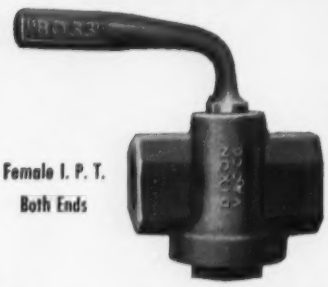
Avoid One Cause of Air Line Leaks and Pressure Loss



"BOSS"

Self-Honing

AIR VALVES



Female I. P. T. Both Ends

Built to withstand the hard knocks of mining and construction service, "BOSS" Valves are also ideal for general use on pipe lines, hose lines, compressor tanks, etc., and for the handling of water. They do not require packing.

Bronze plug firmly seated by spring tension against harder metal of valve body is automatically honed to perfect seat as handle is turned. A straight, full-flow opening extends through valve body and plug, providing greater capacity with no friction loss. Valve opens or closes by a quarter turn of the handle.

INTERNALLY ATTACHED HANDLE— In sizes ¾" to 1½" valve stem and handle are combined in a strong one-piece forged steel unit which is anchored to the bronze plug within the valve body. This patented feature eliminates stem and handle breakage. Sizes ¼", ⅜", ½" and 2" have externally riveted handles.

Male I. P. T. Both Ends

Stocked by Manufacturers and Distributors of Industrial Rubber Products

DIXON
Valve & Coupling Co.
GENERAL OFFICES & FACTORY—PHILADELPHIA 22, PA.
BRANCHES—CHICAGO · BIRMINGHAM · LOS ANGELES · HOUSTON
DIXON VALVE & COUPLING CO., LTD., TORONTO, Associate Companies

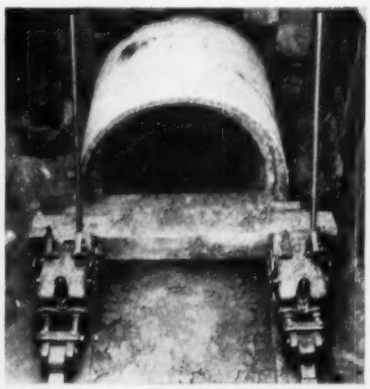
EQUIPMENT NEWS... continued

Belt Co. Powered-frame widening is one of the features of the finishers. Available as an option, this feature permits non-stop changes in widths to speed tapered-lane or interchange paving. For rapid and easy portability, transportation wheels are also available. Hydraulic pedestals at each corner lift the finisher off forms without the need for blocks or special tools. The finishers are equipped with two engines—one to power the traction wheels and another to handle screed travel—and two separate four-speed transmissions. The float operates on a double track and provisions are made for easy crown adjustment. All controls are grouped at a point where the operator has the maximum amount of visibility.—**General Road Machines Div., Chain Belt Co., Niles, Ohio.**

COMPACT ARC WELDER—A new semi-automatic submerged arc welding unit of compact and lightweight design has been produced by Hobart Bros. Co. The new unit is completely equipped with all controls and power cable for plugging in on 110 v, either DC or AC. It comes with a wire reel, caster mounted base, carrying handles, and a gun cable assembly with two welding guns—one flux type with hopper and one open arc type for welding without flux. Rheostats and other electrical components are protected by steel cabinets that can be used as a single unit or separated for remote control operation. The unit is designed for use with any arc welder having continuous current up to 500 amps using solid 5/64 and 3/32 wires and tubular 3/32 or 7/64-in. wires. The head can be removed from the caster-mounted base by

SAVE HOURS, CUT COSTS ON YOUR PIPING JOBS

PUSH PIPE UNDER STREETS, TRACKS, walks, floors and other obstacles with a GREENLEE Hydraulic Pipe Pusher. One-man-operated, portable, simple to operate. No tearing up of pavement . . . eliminates extensive ditching, tunneling, back-filling, tamping, repaving. Cuts job time to a fraction. GREENLEE Hydraulic Pipe Pusher often pays for itself on first job. Two sizes—model shown above for pushing ¾ to 4" pipe. Larger unit, below, for pipe over 4", concrete sewer pipe and large drainage ducts. Power pump also available for extra ease and speed of operation.



GREENLEE

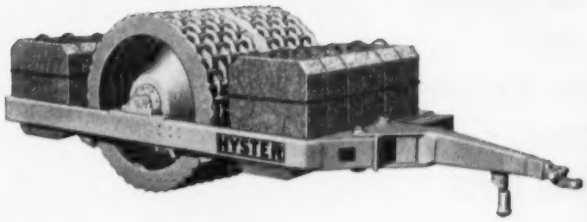
Write today for descriptive literature. Greenlee Tool Co., 2185 Columbia Avenue, Rockford, Ill., U.S.A.

HIGH-SPEED
COMPACTION

LOW-COST
ROCK CRUSHING

EFFICIENT
BITUMINOUS SALVAGE

THE HYSTER "GRID" ROLLER DOES ALL THREE!



Here is the machine road builders all over the world are using on all types of road construction — free-ways, secondary roads, farm-to-market roads, access and logging roads.

Built for long life on any job—rock surfacing haul roads or high-speed compaction on expressways—the "Grid" roller is designed to give you low cost operation and maintenance. Its high capacity tapered roller bearings give long life. Its high-strength cast steel wheels resist wear in rock and abrasive materials. The heavy-duty frame prevents distortion in the toughest going.

"Grid" is the registered trademark for the Hyster open-surfaced roller. Caterpillar is the registered trademark of the Caterpillar Tractor Co.

For full details, call your Caterpillar-Hyster Dealer.

HYSTER COMPANY

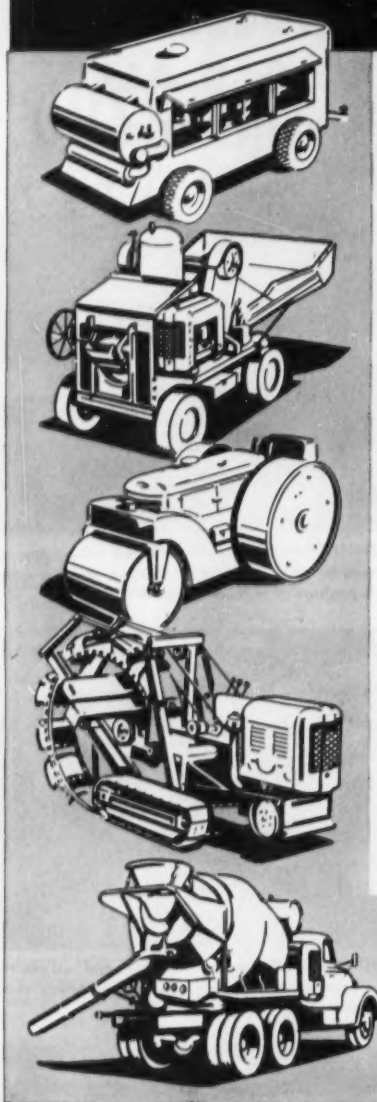
2921 N. E. Clackamas Street.....Portland 8, Oregon
1821 N. Adams Street.....Peoria 1, Illinois
Portland, Oregon • Peoria, Illinois • Nijmegen, The Netherlands

1 EMBANKMENT COMPACTION — High-speed rolling (up to 15 MPH towed by Caterpillar DW15 Tractor) matches compaction with yardage of high-speed earth movers.

2 ROCK CRUSHING — Pit-run rock quickly and efficiently crushed for base and surface courses on secondary road construction and repair.

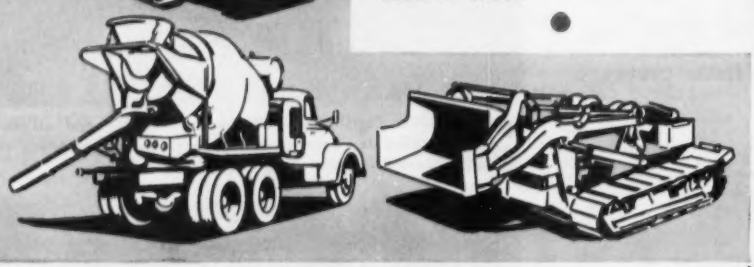
3 BITUMINOUS SALVAGE — Quickly breaking down old ripped-up mat, the "Grid" Roller salvages all of the original aggregate and reusable binder for use in new surface.

MORE THAN 100 BASIC ENGINES,
BUILT TO 2,000 DIFFERENT SPECIFICATIONS,



EQUIP CONTINENTAL WITH POWER PLANTS TAILORED TO THE NEEDS OF CONSTRUCTION MACHINERY OF PRACTICALLY ALL SIZES AND TYPES

Continental Red Seals for specialized applications are available at closely-spaced power levels, in liquid-cooled and air-cooled models, for use on all standard fuels. And, strictly on the score of performance, economy and dependability, they are finding their way into more and more leading makes of road building and construction equipment for every operation from excavation on through final grading. Every Continental Red Seal is not only built for its job, but backed by parts and service facilities from coast to coast.



A COMPLETE LINE OF SMALL AIR-COOLED ENGINES

In addition to its large engines, Continental builds an outstanding line of heavy-duty air-cooled four-cycle models for industrial applications requiring 2 to 4 h.p. Advanced engineering gives them easy starting, high dependability, and unusual lugging capacity at low speeds. For information, address Air-Cooled Industrial Engine Division, 12800 Kercheval Avenue, Detroit 15, Michigan.

CONTINENTAL MOTORS — Powerful as the Nation — AMERICA'S STANDARD

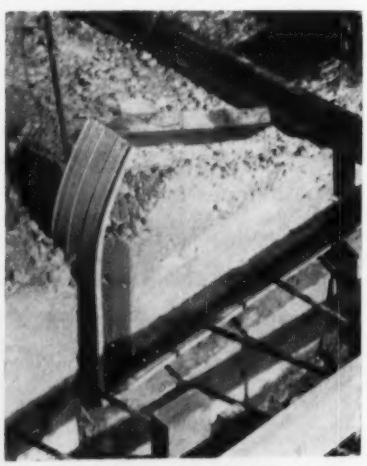
Continental Motors Corporation

MUSKEGON • MICHIGAN

8 EAST 45TH ST., NEW YORK 17, NEW YORK • 3017 S. SANTA FE AVE., LOS ANGELES 58, CALIF.
6218 CEDAR SPRINGS ROAD, DALLAS 9 TEXAS • 1252 OAKLEIGH DRIVE, EAST POINT (ATLANTA) GA.

removing two screws on either side so that the basic unit can be carried easily into cramped places.—**Hobart Bros. Co., Troy, Ohio.**

SMALL VIBRATING HEADS—The manufacturers of the 1¼-in. Wyco Junior vibrator, have announced two additional sizes of small interchangeable heads. One of the heads, only 1⅜-in. in dia, is designed for use in narrow forms with reinforcing bars. The other new head is only 1 in. in dia, said to be the smallest ever made. It is designed especially for producers of prestressed concrete members. A 5 or 7-ft. extension shaft of equally small dia can be attached to the standard Wyco extensions, permitting the use of shafts up to 21 ft long.—**Wyzenbeek and Staff, Inc., 223 N. California Ave., Chicago 12, Ill.**



BAKELITE WATERSTOP — The manufacturer expects a new diaphragm-type waterstop now being used for expansion and construction joints on a St. Lawrence Seaway concrete sewer tunnel job to outlast the structures in which they are used. The waterstops, made of Bakelite vinyl resins, are resistant to water as well as to the acids and alkalies in concrete. Ridges are formed on both sides of the diaphragm-like ribbon so that the waterstop gets a good grip on concrete. A tensile strength of not less than 1,900 lb per sq in. en-

NOW...BANTAM offers 8-TON crane capacity!

and...gives you greater stability where you really need it!

Built by the world's largest producer of truck cranes and excavators.

With or without outriggers you handle more at 15′-20′ and even beyond!

HERE IS THE NEW 8-TON BANTAM with its specially engineered Model 300 crane carrier mounting—offering you increased crane capacity, with or *without* outriggers, at normal working radii (15′-20′-25′) to handle your crane jobs faster, at lower cost.

BANTAM's job-matched performance between carrier and basic machine gives you more lifting capacity per pound of weight than any other rig in its size class on the market today! BANTAM engineering know-how, based on more than 8000 machines in the field, is your assurance of a rig to handle your heaviest work without sacrificing mobility and maneuverability because of excessive "dead" weight. Here is real heavy-duty performance for all your steel erection, concrete pouring and materials handling jobs that call for maximum lifts with maximum stability.

You move faster, work better, for less cost with a BANTAM!

HEAVY-DUTY, BANTAM-BUILT 300 CARRIER MAKES THE DIFFERENCE!

The 300 crane carrier is engineered and built especially for the new 8-ton BANTAM basic unit. Job-matched for maximum performance, it offers stability where it counts!

Point by point and job by job, the 300 is superior—in performance, in quality, in durability.

ONLY BANTAM in its size class builds its own *complete* crane carrier line . . . job-matched to outperform *ALL* others!

BEFORE YOU BUY ANY CRANE — SEE THE NEW 8-TON BANTAM AND 300 CARRIER!

CM-145

Quick facts about the new 8-ton BANTAM

BANTAM T-35 mounted on Model 300 carrier • 16,000-lb. lifting capacity • Open-throat, heavy-duty welded boom • 8-part boom hoist line . . . 4-part hoist line • 1250-lb. additional counterweight • Heavy "A" frame pipe and braces • High gantry . . . telescoping boom steps • Double hook rollers and flame hardened trunnion rollers • Boom hoist for both power up and power controlled lowering • Precision control for fast, safe load-spotting • Available with remote control.

SCHIELD Bantam Co.

221 Park Street, Waverly, Iowa

SMITH "CONCRETE FACTORY" ON WHEELS ROLLS IN NEW PROFITS

* Here's your answer to the problem of the low slump, "inspection type" concrete needed for tomorrow's jobs. This new Smith mixer, with the most modern drum ever designed, is your best buy — for these reasons:

PRODUCTION

Cone and feed chute let materials "hurdle" over first spiral of blades to the big diameter section of drum. Materials can't lose momentum by dropping ahead of the first blade.

CONTROL

You get absolute control over your mix, in addition to fast, smooth discharge regardless of slump. This is because of the patented "T"-shaped blades plus Smith's multi-speed transmission.

QUALITY

All materials are *double mixed* by a true flow action — the most positive, complete mix of any high discharge mixer made. More area in the big diameter section gives more movement per revolution to each batch.

low maintenance cost

Drums last longer — they're built of Manten steel with a cast steel drum head. Blades, also of Manten steel, have a hard surface coating welded to *both* fins.

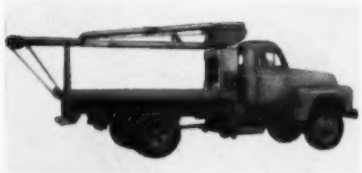
available now in your choice of sizes

THE T. L. SMITH COMPANY
Since 1900, the pioneer designer and foremost manufacturer of the world's finest mixers.

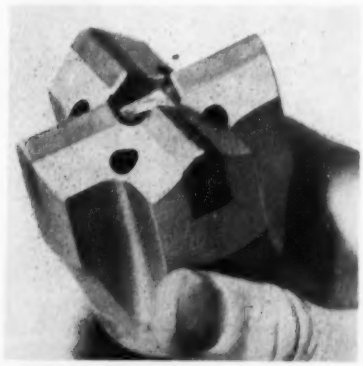
SMITH

Milwaukee 1, Wisconsin • Lufkin, Texas
affiliated with Essick Manufacturing Company, Los Angeles, California.

ables it to withstand concrete movement without being sheared. The Bakelite vinyl resins also are noted for their elasticity. Fifty-ft coils of the waterstop, called Duraseal, can be carried easily. Splicing is accomplished by heating both ends and holding them together while they form a bond. The waterstops are available in a variety of ridge patterns in widths from 3¼ to 9 in. wide.—**Electrovert, Inc. 489 5th Ave., New York 17, N.Y.**

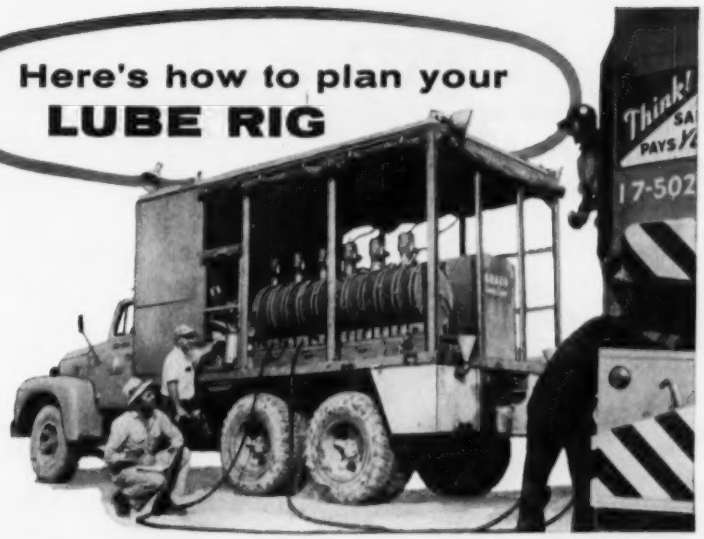


COMPACT CRANE—Truck Crane, Inc., now operating as a subsidiary of Anthony Co., has produced a 5,000-lb capacity unit that requires only 18 in. of space behind the truck or tractor cab. The entire truck body is left free for useful payload area. Power for the Truck-Crane unit is hydraulic through a pto-driven pump. Boom swing is 280 deg. The boom reaches or retracts hydraulically in the horizontal position or at any point up to 85 deg elevation. Both horizontal and elevating-type booms are available. Control levers are located on both sides of the truck. A high boom pivot point on the mast allows high loading right up against the crane superstructure. Stability is provided by standard hydraulic outriggers. — **Anthony Co., 1750 Baker St., Streator, Ill.**



SWEDISH CARBIDE BITS—Atlas Copco has introduced a new line of Sandvik Coromant detachable bits with tungsten carbide inserts. The 16 bits in the new line range from 1½- to 4½-in. in dia, and are for

Here's how to plan your
LUBE RIG



Call on Graco's experience in lube rig design . . . select Graco's quality lube components that fit any need. Our engineers have helped design hundreds of "job planned" lube trucks. They can help you if you need assistance.

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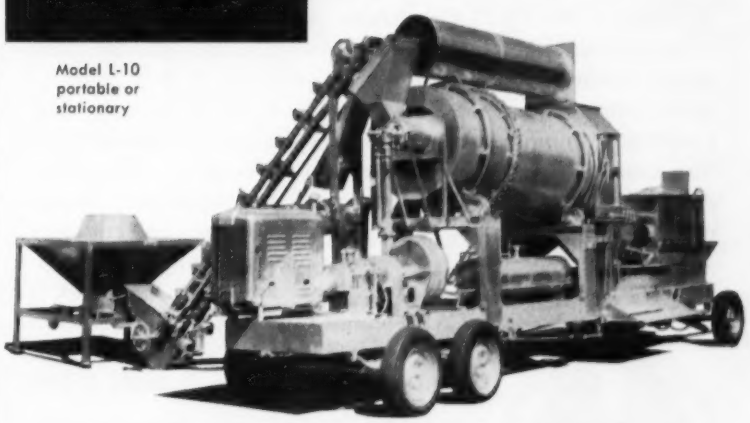
GRAY COMPANY, INC.
538 Graco Square, Minneapolis 13, Minn.
Factory Branches: New York (Long Island City) • Detroit • Philadelphia • Chicago • Atlanta • Houston • San Francisco.

1 Decide your needs. What's required for your equipment and service schedules?
2 Using Graco catalog, select reels. Choose size, power ratio of pumps.
3 Make rough sketch. Draw simple plan of your truck platform, giving dimensions and capacity. We'll plan from here.

BEFORE YOU BEGIN, send for new helpful 24 page catalog. Shows special units. Illustrates components. Ask for Graco Catalog 701.

White
NEW ASPHALT PLANT
$13,500 (f.o.b. factory)

Model L-10 portable or stationary

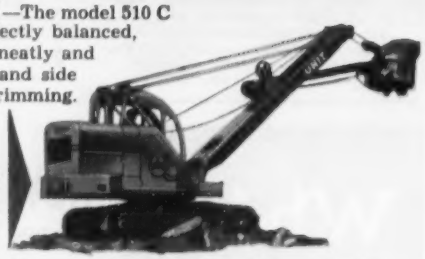


20 tons per hour hot mix capacity

Batch type 1000 lb. pug mixer with air-controlled gates. Has built-in asphalt heating kettle, reciprocating plate aggregate feeder. 50 hp engine or 30 hp electric motor. Write for catalog and name of nearest dealer. White Manufacturing Company, Elkhart 6, Indiana.

ONE MAN LOADS . . . ONE MAN OPERATES!

AS A TRENCHOE—The model 510 C is powerful, compact, and perfectly balanced, it digs deep . . . trims corners neatly and squarely . . . cuts level floors and side walls without additional hand trimming.



AS A SHOVEL

The model 510 C performs with speed and precision. Has plenty of stability and produces maximum yardage.

ADDED to the UNIT Challenger ⅜ yard line of excavating equipment is the new UNIT 510 C. This crawler type model features: One Piece Cast Gear Case . . . Self aligning Replaceable Hook Shoes . . . Force Feed Lubrication . . . Full Floating Trunnion Mounted Tapered Drums . . . Straight-in-line Engine Mounting with Torque Converter . . . Hydraulic Actuated Clutches and Automatic Traction Brakes . . . Interchangeability of Parts that simplify maintenance and cut costs . . . plus many other advanced engineering features.

And the safety promoting FULL VISION CAB enables the operator to SEE what he is doing at all times. Get all the facts. Write for your copy of Bulletin C 900.

UNIT CRANE & SHOVEL CORPORATION
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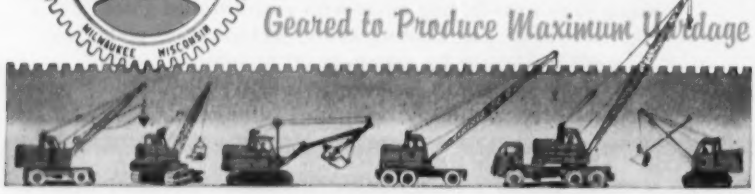
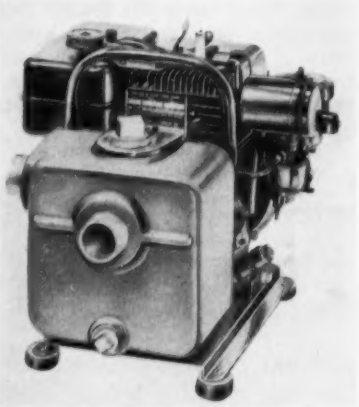
UNIT CRANE & SHOVEL CORP. UNIT MILWAUKEE WISCONSIN

Geared to Produce Maximum Yardage

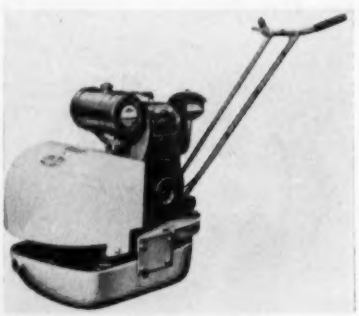


A7-5006

use on standard shoulder drillrods with F, H, D, and K threads. The new line of Sandvik Coromant 776 bits are made of Swedish steel. —**Atlas Copco Eastern, Inc., Paterson, N. J.**



NO CHECK VALVE—Midland's new line of self-priming centrifugal pumps has a new design that eliminates the need for a check valve, a critical maintenance point on most pumps. According to the company, the new Midland pumps cannot accidentally lose their priming liquid. The new design also includes a volute cast separately from the main body. This enables the manufacturer to use an iron volute to resist wear while the body of the pump is aluminum for lightness. Midland pumps are available in 1½- and 2-in. sizes with rating of 5,000 and 7,000 gph. —**Midland Products Co., Midland Park, N. J.**



VIBRATING COMPACTOR — A self-propelled, one-man-operated vibratory soil compactor called the model CM20 Terrapac has been introduced by Vibro-Plus. The compactor delivers a 6600-lb impact blow 2,000 times a min. Self-propelled working speeds up to 75 fpm are possible. A simple vibra-

For men who like to underbid their competitors...

(and make a nice profit, too)

Pioneer *VIBROmatic* Paver excels all others in uniform density and quality of mat

The Pioneer Bituminous Team

The PIONEER *VIBROmatic* Paver operates on an entirely new principle. Simple in design, and easiest-of-all-pavers to operate, yet it lays a mat of exceptional quality . . . *and lays it faster than any other paver yet built!*

Secret of this unusual performance is its revolutionary *VIBROmatic* oscillating screed action which, together with the high-speed, heated vibrating compactor, lays a smooth mat with fewer voids and more uniform density than any other paver.

Performance is just as outstanding at high speeds as low. The PIONEER *VIBROmatic* has laid smooth, even mats 1½" thick, 12' wide at a 73' per minute rate.

PIONEER HOT-MIX PLANTS are champions in *Mobility* and *Performance.*

First. Mobility. Only two main units; each complete on its own rubber-tired chassis. Those hours you'll save per move count up fast in dollars and cents.

Second. Performance. Measure it by output and you'll find PIONEER *Continuflo* plants delivering up to 150 tons per hour. Measure it by quality of product? You'll discover these modern plants give exact proportioning and uniformity that meets toughest specifications. Or economy? Savings of fuel and power, efficient recovery of fines, and low upkeep help you attain a low cost per ton.

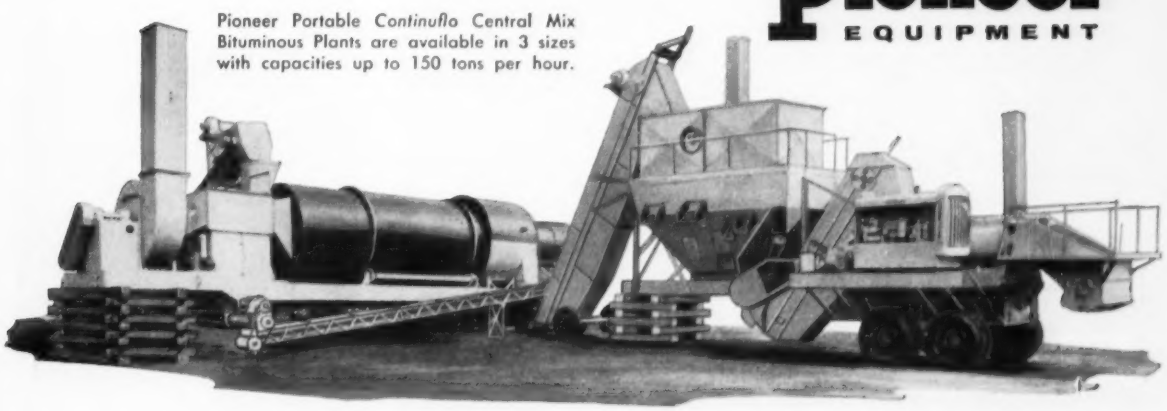
SPECIFICATIONS: BITUMINOUS PLANTS

	MODEL 51	MODEL 81	MODEL 102
Number of Units	2	2	2
First Unit	Mixer and gradation screen with 3-compartment bin	Mixer and gradation screen with 3-compartment bin	Mixer and gradation screen with 4-compartment bin
Second Unit	Drier and dust collector	Drier and dust collector	Drier and dust collector
Auxiliary Units	Feeder elevator (with necessary feeder), hot elevator and fines feeder (if desired)	Feeder conveyor (with necessary feeder), hot elevator and fines feeder (if desired)	Feeder conveyor (with necessary feeder), hot elevator, burner and fines feeder (if desired)
Rated Capacity	40-60 cu. yds./hr.	60-80 cu. yds./hr.	up to 150 tons per hour
Total Weight (Approx.)(Elec.)	80,000 lbs.	98,500 lbs.	145,000 lbs.
Approx. H.P. Required (Elec.)	120-130	145-170	270

For further information, write or call Pioneer Engineering, Division of Poor and Company, Inc., Minneapolis 14, Minnesota or your Pioneer Distributor.

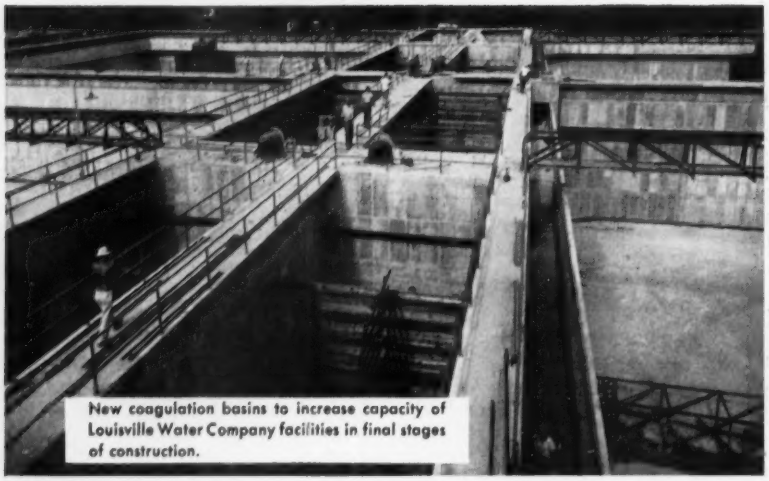
Pioneer®
EQUIPMENT

Pioneer Portable *Continuflo* Central Mix Bituminous Plants are available in 3 sizes with capacities up to 150 tons per hour.



(Advertisement)

How Pre-Fab Forms Saved Time, Material On Water Plant Job



New coagulation basins to increase capacity of Louisville Water Company facilities in final stages of construction.

Contractor Forms 200,000 sq. ft. contact area with 14,000 sq. ft. of panels

Forming a 350′ square water basin with exterior and interior walls 31′ high presents no problem to the experienced contractor. But, when the job must be done in minimum time at lowest possible cost to meet tough pouring and finishing specifications, careful planning and operation are required.

When the Henry G. Bickel Company and the Charles A. Connel Company were awarded the contract for the massive Louisville Water Company coagulation basins at Louisville, Kentucky, they selected the Uni-Form Panel System to form the 200,000 sq. ft. of contact area the job required.

Forming started fast, because the Uni-Form Panel System is ready to use when it reaches the job. Valuable time, labor and material savings were made because Uni-Form Panels require minimum alignment and bracing on 1 side only. The Uni-Forms were assembled and locked into a tight, rigid form with Uni-Form Ties supplied in exact lengths to provide automatically accurate thickness of both battered and straight walls.

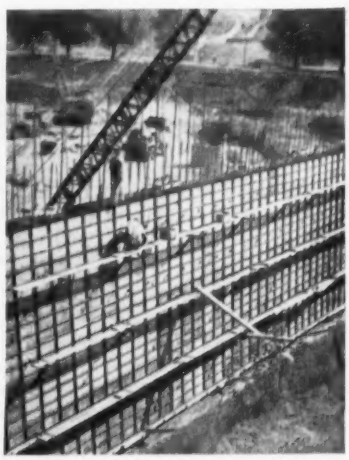
One side of the form was erected, permitting easy, unhampered placement of reinforcing. Since specifications did not permit the use of chutes or tremies, pouring pockets were provided as the forms were closed to maintain positive control of concrete placement.

Fast erection and stripping features of the Uni-Form System enabled the contractor to form the entire 200,000 sq. ft. of contact area with only 14,000 sq. ft. of Uni-Form Panels. Panels were used an average of 14 times without the necessity of maintenance or repair.

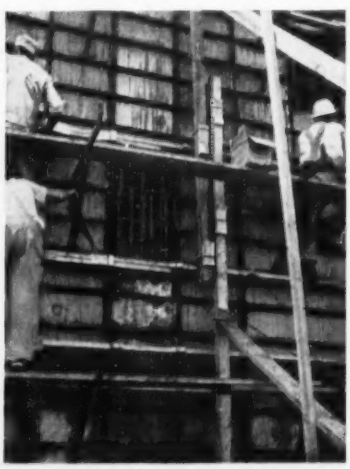
The simplicity of the Uni-Form Panel System, together with the services provided by Universal Form Clamp Co., insured fast job progress and satisfactory completion under the capable supervision of Harry Hunter, Supt.

Uni-Form Panels are versatile, high speed forming tools. They're used by the country's most successful contractors to form every conceivable type of construction. They are rented or sold. Universal Distributors and Branches are located from coast to coast. Write for Uni-Form Catalog and complete details on Uni-Forming—the modern way to form concrete.

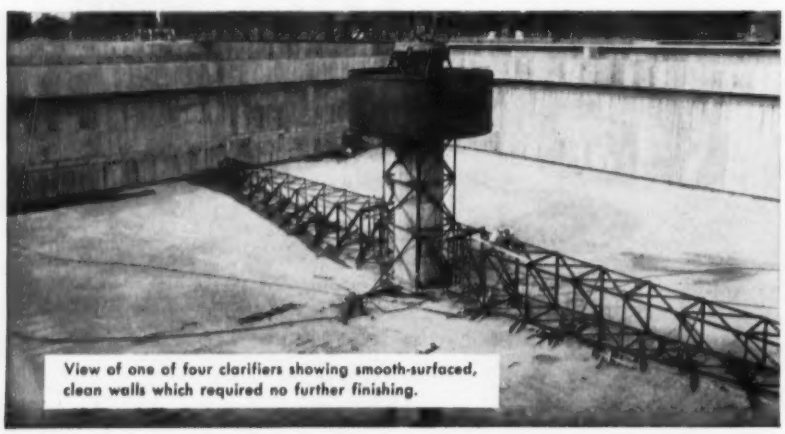
UNIVERSAL FORM CLAMP CO.
1238 N. Kostner Avenue • Chicago 51, Ill.



Section of exterior battered wall 31′ high, showing Uni-Forming nearly complete. Uni-Form Scaffold Brackets replaced costly conventional scaffolding systems.



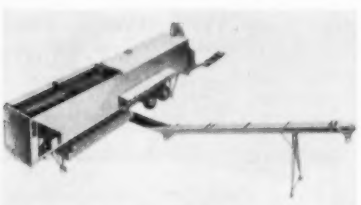
Pouring pockets permitted specified control of concrete placement.



View of one of four clarifiers showing smooth-surfaced, clean walls which required no further finishing.

tory unit is mounted on the 34x20-in. base plate and the gasoline engine is mounted on a platform insulated from vibration by four springs. Power is delivered through a trouble-free V-belt drive. A centrifugal clutch permits the engine to idle without engaging the vibratory unit. The machine is designed so that it can maneuver close to abutments, retaining walls, or piling. It is said to be ideal for backfill jobs and road patching or shoulder work. Total weight of the unit is 950 lb. A tow bar and two rubber-tired wheels are provided for towing.—**Vibro-Plus Products, Inc., Stanhope, N. J.**

OPTIONAL BOOMS—Arched hoe boom attachments for both the type K and type L machines are now being offered by Insley. Both booms are of the same design with two vertical sheaves near the boom mid-point and an enclosed horizontal sheave at the bucket. For the type K machine, the attachment has a 16¾-ft boom, 10 1/6-ft arm (hinge pin to bucket teeth), and a digging depth of 17½ ft. The attachment for the type L machine has an 18¾-ft boom, 10 1/6-ft arm, and a digging depth of 19¼ ft.—**Insley Mfg. Corp., Box 167, Indianapolis, Ind.**



HIGHLY PORTABLE—C. S. Johnson's new Porto-Batcher plant quickly can be disassembled into three trailer units that can travel immediately over highways. Aggregate capacity of the Porto-Batch is 39 cu yd in four compartments. A built-in water tank holds

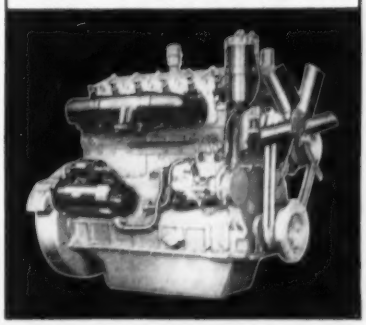
excavating granite overburden

2¼ yard MICHIGAN gets fast maneuverability with WAUKESHA Diesel

● Looks too tough for a rubber-tired tractor shovel. But, Waukesha-powered with a 135-DKB Diesel, this 2¼ yard Michigan 175-A is excavating granite overburden in development work at the Crystal fluorspar mine, near Darby, Montana, at 6900 ft. elevation. 500 tons per 7-hr. day! Good going, but it takes power and lots of it—the smooth, speedy, flexible power of a Waukesha Diesel. This same 175-A Michigan loads fluorspar ore, too, "hopping" from one 12-ft. bench to another . . . to blend the grade of ore which varies at different bench levels. 400 blended tons per 7-hr. day takes speed and mobility.

339

135-DKB Diesel—4¼-in. bore x 5-in. stroke; 426 cu. in. displacement, with counter-balanced crankshaft. **Get Bulletin 1573.**



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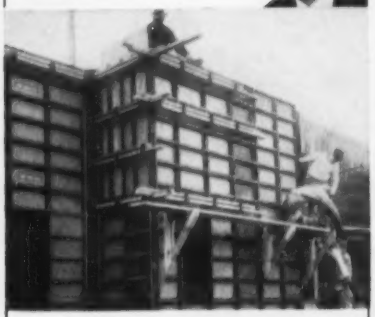

"We first used Compo forms over a year ago for the deep basement area and for grade beams for the new Service Center of the Pennsylvania Light & Power Co. Although this work was done during the winter, requiring heat for curing, we advanced our schedule with ease by the use of Compo forms. Since then we have also made time and money by using these forms for foundations for a church, a school, a shopping center and a swimming pool."

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New York 7, N. Y.

EQUIPMENT NEWS . . . continued

650 gal, and 280 bbl of cement storage is provided. Two styles of discharge conveyors are available: one with an 8 5/6-ft above-ground clearance for the batch trucks; and a second with an 11½-ft clearance for transit-mix trucks. Production capacity of the new batcher varies from 60 to 100 batches per hr, depending on batch quantities and truck size. An inter-locked batch control with repeater is fully automatic. The first public showing of the Port-O-Batcher plant was held at the Chicago Road Show. **—C. S. Johnson Co., Champaign, Ill.**

NEW JAEGER MIXERS—A new line of fast charging and discharging Jaeger trucks features weight reductions of several hundred pounds per unit and a number of new engineering advancements. The trucks are available with a choice of a three-speed automotive-type or hydraulic-reversing transmission, and with a separate engine drive or front-of-engine or transmission power take-offs. The trucks feature Jaeger's recently developed water measuring tank in which a new type of controlled gravity feed replaces syphon feed. This feature eliminates the need for self-priming pumps, goosenecks, or special valves or fittings. A 1½-in. straight centrifugal pump with 60-gph capacity is now standard on the new F model trucks. Rear water entry is standard and front-of-drum entry with grout-proof water jet is optional. A redesigned front trunnion stand makes possible a center of gravity that is 4 in. shorter in pto applications. All body weight is carried within the width of the truck frame. The rear drum cradle is of the open-type design to prevent material from building up. Drum rollers are fully enclosed and equipped with grout-proof bearings.**—Jaeger Machine Co., Columbus, Ohio.**

continued on page 306

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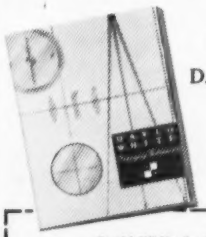

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Why not investigate the large-capacity economy afforded by the complete line of Mack off-highway dumpers? Invite your Mack representative to give you full details and specifications. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.

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Excavator With Four-Wheel Steer

FULLY CONVERTIBLE to shovel, crane, clamshell, drag, and hoe, Thew's model SP-107 is a self-propelled machine with four-wheel drive and four-wheel steer. It develops a 7-ton lifting capacity in all positions on the turntable swing without outriggers, according to Thew. The upper machinery is mounted on a short-coupled, square (96x96 in.) rubber-tired carrier.

Four-wheel drive is provided along with hydraulic power steering on the wheels of one axle. Optional equipment provides hydraulic power steering of all four wheels. The rig has a 15-ft turning radius, and wheels can be positioned in the same direction so that the machine can crab sideways.

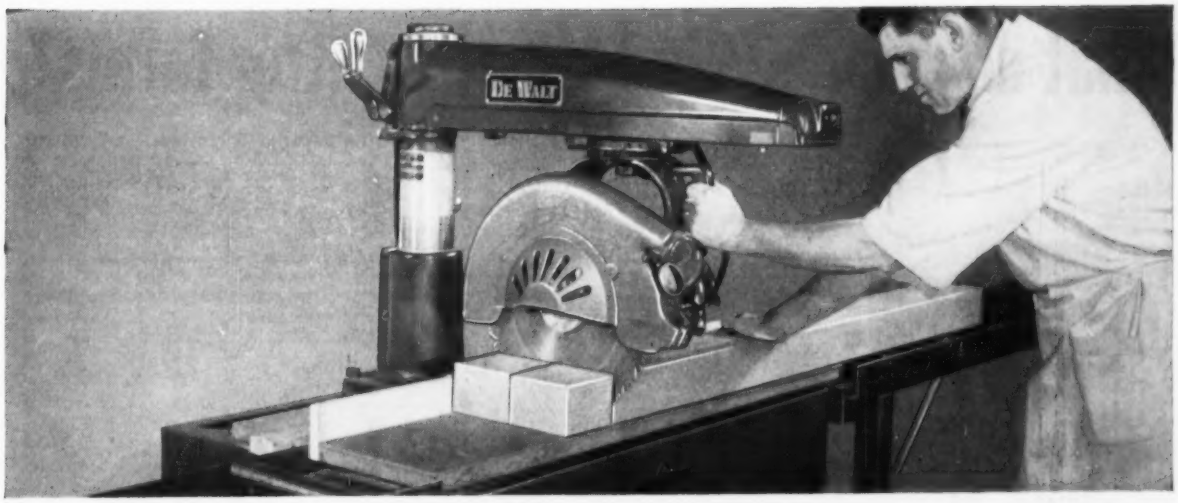
Power take-off on the turntable is through an automatic transmission with torque converter. Three travel speeds at up to 15 mph are provided for both directions. Independent travel provides for hoisting, swinging, boom dericking, and traveling simultaneously with each operation under separate clutch control. Turntable features include anti-friction bearings on all horizontal power shafts. Each horizontal power shaft is readily removable as a complete units. The turntable revolves on four sets of hook rollers. A hydraulic system provides convenient and easy-acting control of the seven identical clutches that actuate turntable and carrier functions. **—The Thew Shovel Co., Lorain, Ohio.**

Powered Blade Adjustment

MASTER'S Powermatic Turn-a-Trowel allows the operator to change to any blade position between float and finish by pushing or pulling a knob on the handle. Engine power changes the blade pitch. The trowel measures only 14 in. from slab to the top of the engine, giving the trowel what is said to be the lowest center of gravity in the field. Tests (above) prove that the machine can be handled easily with one hand. The trowel features an automatic clutch that doesn't engage the engine until it has reached operating speed. It is also equipped with a dead-man control. The 34-in. trowel is available in three and four-blade models.—**Master Vibrator Co., 167 Stanley Ave., Dayton 1, Ohio.**

New Koehring

NEWEST ADDITION to the Koehring line of excavators is the crawler mounted model 805, which can be used as a crane with a 150-ft boom, a 2 to 3-yd dragline, a 3½-yd clamshell, or a 2-yd shovel. As a shovel, the machine takes a 25-ft boom and 18½-ft sticks. Standard crawlers are 14 2/3-ft. long and optional crawlers are 18 1/3-ft long. Shoes are 24



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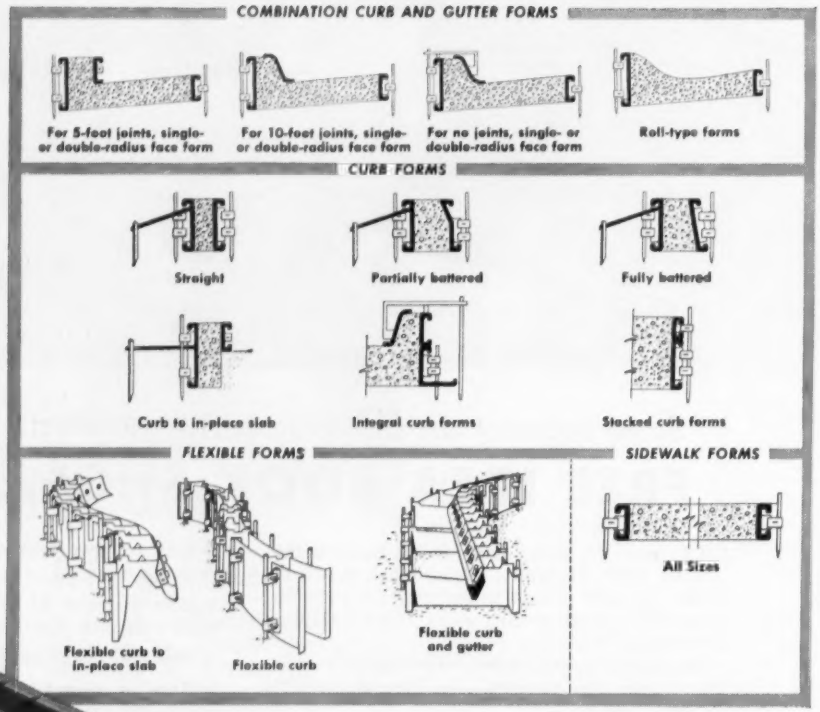

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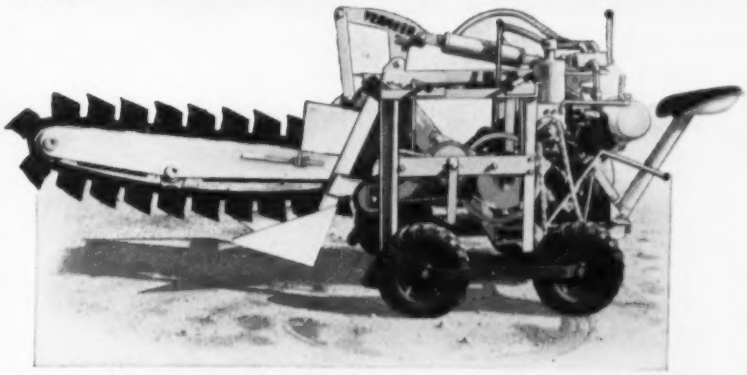
and 30-in. wide. Equipped with friction-type steering brakes that are spring set and air power released, the machine can lock one crawler and turn within its own length. As a crane using a boom of 75 ft or higher, a power raised and lowered high A-frame is standard. Six turntable and six hook rollers are used to give the rig good stability and even weight distribution under any digging or lifting strain, according to Koehring engineers. Turntable rollers are 12 in. in dia and conical shaped to eliminate wear from scuffing. Antifriction bearings are used on the countershaft, horizontal swing and traction shaft, main drum shaft, vertical swing and traction spur bevel gear shaft, revolving fairlead yoke and retract clutch drum.—**Koehring Div., Koehring Co., 3026 W. Concordia, Milwaukee 1, Wis.**

HAND - POWERED IMPACT WRENCH—The Swench is said to be the first manually powered wrench to incorporate the impact principle. It will deliver torque values of up to 20 times that applied to the handle by the operator and it can be used to manually tighten bolts up to 1¾-in. in dia. The impact force is controlled

Biggest Little Ditcher on the Market!



VERMEER W-2 POW-R-DITCHER

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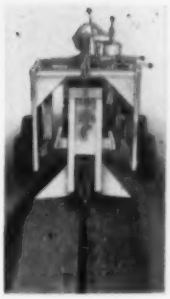

The rugged, heavier-built model W-2 Pow-R-Ditcher digs 2½" to 4" wide, 3' deep at 1' to 10' per minute. Here's an inexpensive, self-powered, 4-wheel drive unit for digging small trenches. Has hydraulically operated heavy boom, heavy chain and heavy frame. Only 48" wide. Fully tested and used by many contractors, municipalities, institutions and custom operators.

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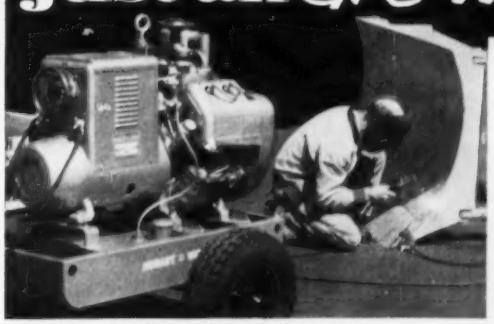

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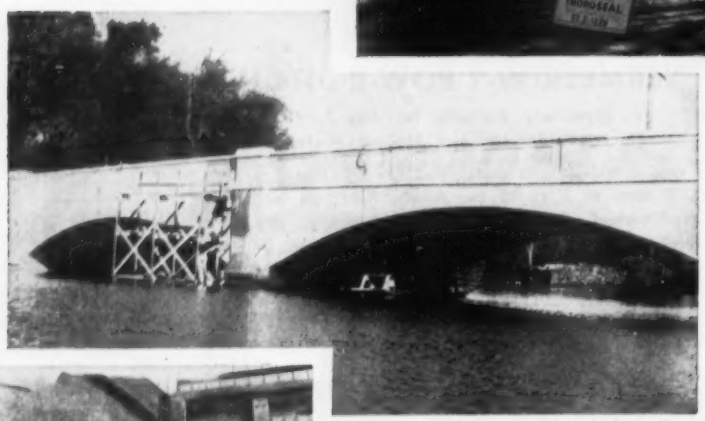

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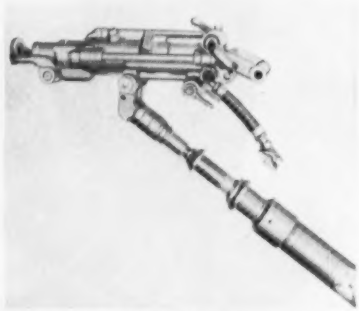
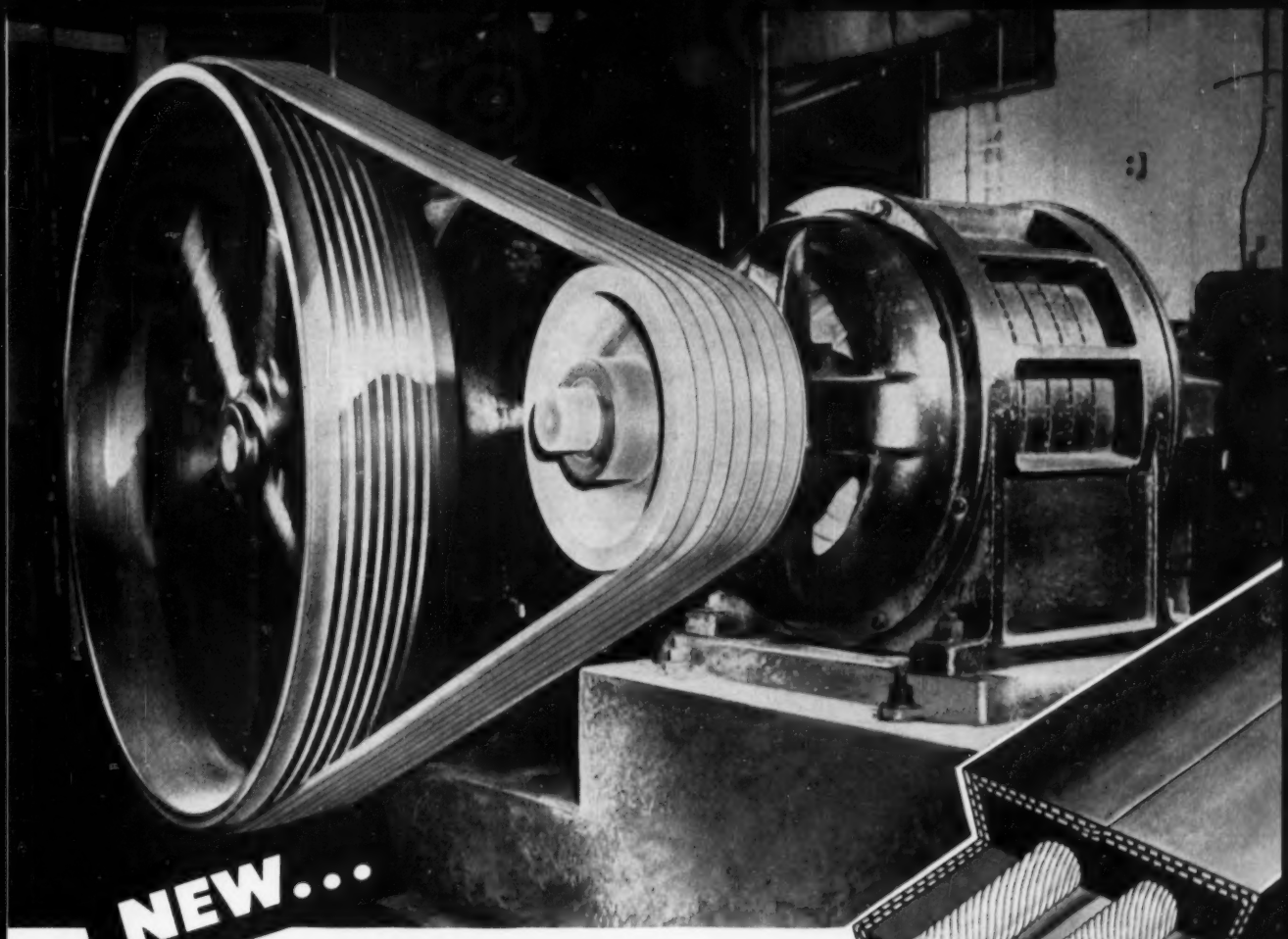
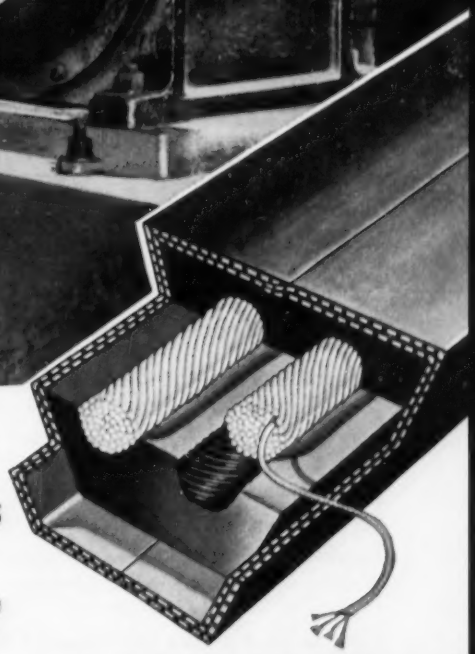
through a simple spring setting. The Swench, which is handled like an ordinary ratchet wrench, has two drive extensions — one for loosening and one for tightening bolts. The nut is engaged by a standard socket and as the handle is pulled a spring and rotar mechanism delivers rotary hammer blows automatically through the socket to the fastening at torque values of up to 20 times the pull applied to the tool handle. One impact is delivered for every 30 deg of movement of the handle. Impacts may be delivered in succession by continuous movement of the handle in one direction, or the operator can apply impacts singly or in short bursts by reciprocating the handle like a ratchet wrench. The Swench is available in three models. Model 500 fits ½-in. sockets and takes a range of bolts through ¾ in. It is 11 in. long, weighs 4½ lb and sells for $95. Model 750 fits standard ¾-in. sockets and takes a range of bolts from ½ to 1¼ in. It is 16 in. long, weighs 10½ lb and sells for $135. Model 1000 is designed for 1-in. sockets and for bolt sizes up to 1¾-in. — **Swenson Engineering, P.O. Box 43, Branford, Conn.**



BETTER AIR LEGS — LeRoi-Cleveland telescopic air legs now have an improved ball-lock type of drill connection and several other internal design changes to cut parts wear. The new drill connection is a spring-loaded assembly that allows easy mounting or dismounting of the drill simply by moving the outer covering release. The mechanism is sealed against dirt and sludge, and the connection is said to be stronger than the former bayonet-type connection. Other improvements include umbrella-type drip shields that divert water and sludge from entering working parts; a replaceable steel stem section on the smaller piston;



NEW...



Thermoid
Powerflex Hi-Capacity V-Belts

40% stronger
than standard belts!

Where more driving power is called for, switch to Powerflex Hi-Capacity V-Belts. These new *premium* belts can step up the drive capacity of "under-belted" drives by as much as 40%.

If your present belts are being stretched beyond their take-up allowance . . . or if you're going to replace worn or damaged pulleys . . . change to Powerflex Hi-Capacity V-Belts. They permit you to use fewer belts and narrower sheaves . . . reduce drive costs.

Powerflex Hi-Capacity V-Belts are available in all standard sizes, and feature a special oil-resistant cover which prolongs belt life. Static conducting covers can be supplied. Order from your Thermoid Distributor, or write direct for complete information.

There's a Thermoid Conveyor Belt

. . . and Thermoid Hose for every job.

Thermoid

THERMOID COMPANY • Trenton, N.J.

D-A announces...

NEW TORQUE FLUID DEVELOPMENT

New D-A TORQUE FLUID cuts fluid consumption... increases converter life!

1 Ends Seal Troubles! New D-A Torque Fluid contains a *new* additive that preserves original resiliency of the synthetic rubber seals . . . prevents seal hardening, cracking and shrinkage . . . controls seal swell to 0.2%. D-A Torque Fluid *stops* fluid leakage.

2 Stops Varnish and Sludge! New D-A Torque Fluid contains a *new* type high-temperature oxidation inhibitor that prevents varnish and sludge formation on pumps, valves and blades—even at highest permissible operating temperatures.

3 Usable down to Minus 35° F.! New D-A Torque Fluid has a pour point of minus 35° F. to assure adequate lubrication and maximum efficiency even at coldest winter temperatures.

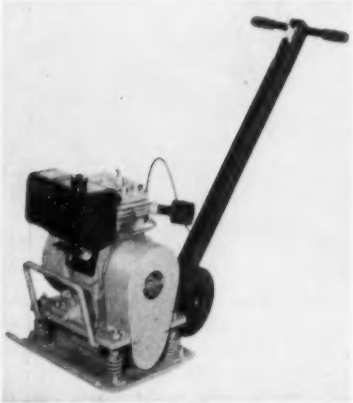
D-A Torque Fluid is the result of extensive laboratory research, thorough field testing and painstaking analysis of operating results. Already approved for Allison Torqmatic Transmissions and Retarders, it is currently being field tested by other leading manufacturers.

24-hour delivery anywhere in the U.S.A.

New D-A Torque Fluid is available now . . . in D-A warehouses across the nation. Contact your nearest D-A Representative for complete details.

D-A *makes equipment last longer*

and a taper locking design on the smaller piston head that makes it easier to centralize the head in the cylinder. The new air legs are designated the AL92B and the AL93B. Both are available with 48- or 72-in. feeds. Conversion kits are available for changing former models to present design.—**LeRoi Div., Westinghouse Air Brake Co., Milwaukee 1, Wis.**



NEW COMPACTOR — Maginniss' new Powr-Pactor self-contained vibratory compactor — designed for use on granular soil, stone subbases, asphaltic concrete and soil cement mixtures—provides variable vibrating frequencies of from 2,400 to 7,000 per min and compacting forces of up to 4,000 lb. The compacting plate, constructed of ⅜-in. alloy steel, gives 12x18 in. of effective compacting area. The entire unit weighs 230 lb. Power is provided by an air-cooled Wisconsin engine mounted on a vibration-free plate. A V-belt-driven vibrator eccentric rotates on four ball bearings within a sealed housing. Powr-Pactors are also available with Hi-electric 180- or 60-cycle electric motors in place of the gasoline engine. Dolly wheels and a lifting bail are provided to facilitate movement on the job and loading. — **Maginniss Power Tool Co., 154 Distl Ave., Mansfield, Ohio.**

SAVES INJECTORS — A new diesel fuel developed by Standard Oil Co. of California is said to have an advanced detergent action that retards rusting, cuts smoke, and keeps diesel injectors clean. Called Chevron diesel fuel, it is said to have qualities that prevent the

continued on next page

Does Steam Cleaning Pay?

Tricycle mount with zero pressure tires makes this Malsbary 250 HPC easy to move around shop or yard. You get the explosive 325° F. solution at 300 lb. pressure needed to quickly remove sticky tars, mud and corrosive greases.

Yes, if you're using Malsbary HPC, users report:

Shortens downtime—"In winter, heavy equipment comes in covered with ice, frozen mud, hard grease and grime — tough to get off, but 2-gun Malsbary 300 HPC really does a dandy job on it. In other seasons, it's heavy grease and mud, but Malsbary speed on cleaning and degreasing parts, engines and heavy rigs enables us to set up a tight maintenance and repair schedule."... Savin Construction Co., user of 7 Malsbary HPC cleaners at different job sites.

Gets rid of road oil—"Our Malsbary 250 saves cleaning time, repair time, re-assembly time. It removes road oil—a job we couldn't do with our previous cleaner."... Empire Equipment Co.

Improves worker performance—"You can't clean all the 'crud' off by hand. Anyhow Malsbarys do it so much more easily. We find our mechanics like to work better on a clean tractor. When you send a clean, painted, repaired-like-new machine back out to work, operators treat it like new, too."... Peterson Tractor & Equipment Co., user of 5 Malsbary HPC cleaners.

What HPC Means to You

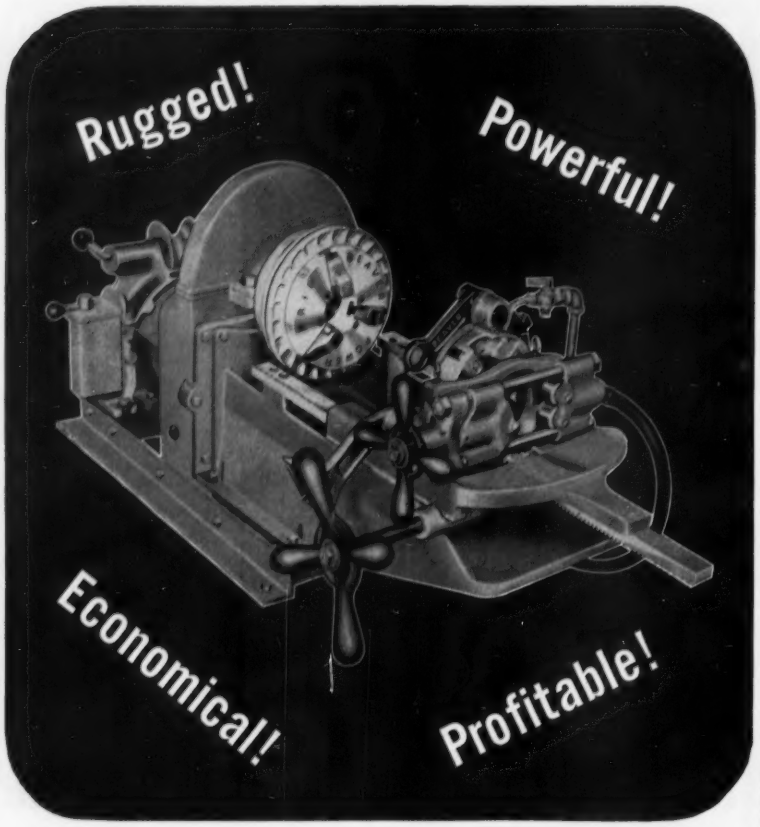
Malsbary High Pressure Combination cleaners combine pumped hydraulic and thermal pressures (an exclusive, patented feature), deliver a 300-400 lb. cleaning blast, at temperatures 100° F. higher than any other cleaner... and they do it on a 24-hour, 7-day week, if necessary. This combination cleans 4 to 10 times faster than most other cleaners and at 1/2 to 1/5th the cost. Cleaning construction rigs is a tough task requiring both the pressures and high temperature you get only with Malsbary HPC.

Why waste time and money with limited capacity cleaners when you can do so much more, faster and better with HPC? Ask your Malsbary dealer for a demonstration (see yellow pages of phone directory), or write us now for free literature.

103

MALSBARY MANUFACTURING CO. SINCE 1921

Room C5, 845-92nd Ave., Oakland 3, Calif.



New Beaver Model-A

The World's Fastest Portable Pipe Machine!

THREADS 2" PIPE IN 15 SECONDS!

A rugged, heavy-duty, portable, low-upkeep pipe and bolt machine. Range—1/8" to 2" pipe; 1/4" to 2" bolts; up to 12" with drive shaft. High production with low maintenance cost Beaver Power Grip Wrenchless Chuck standard equipment. All gears run in oil. Has rack and pinion feed with 12" of working space. Cone reamer mounted on swinging arm. Increased oil flow delivers two gallons of oil per minute for perfect threads and longer die life. Oil pump easily accessible for quick, thorough cleaning. Mono-type, duo-type, and Quadra-type die heads available. Your choice of wheel or automatic knife cut off. Built-in outboard pipe support instantly indexes for size. No double chucking. Motors—110/115 or 220/230 volts; 25/60 cycle Universal; 220/440 three phase, 60 cycle. Explosion-proof, or special motors and switches, extra.

CAN'T TELL IT ALL HERE!
Write for latest facts on all Beaver Machines!

BEAVER PIPE TOOLS INC.
261-569 DANA AVE.
WARREN, OHIO

HAVE A CUTTING OR THREADING PROBLEM?
Let Our Engineering Research Department help you solve it.

formation of varnish, gums, and rust on operating parts contacted by the fuel for periods far beyond normal. The fuel cuts down the accumulation of gummy material that forms on injector plungers from the oxidation of fuel at high temperatures. The new fuel is available throughout the West at no increase in price over other diesel fuels.—**Standard Oil Co. of Cal., 225 Bush St., San Francisco, Cal.**

ANNIVERSARY MODELS—International Harvester is celebrating its 50 yr. of motor truck production by introducing its Anniversary line of light duty trucks. The line ranges from the ½-ton A-100 series with a 4,200-lb gross vehicle ratings to a six-wheel cab-forward model rated at 33,000-lb gvw. Designated the A-line, the new trucks are available in a range of four, six, and all-wheel drive models with gasoline and LPG power plants.

Pictured is the model A-180, rated at 19,000 lb gross vehicle weight. It is powered by a 141-hp International Black Diamond engine and a 154-hp, 308-cu-in. engine is available as an option. Wheelbases on this model range from 129 to 256 in. For the rest of the line, a choice of five gasoline and four LPG-fueled International valve-in-head six-cylinder engines are available. Design features include a wider cab, a new Sweep-Around windshield, and Silent-Vent window ventilator wings that provide maximum air movement through the cab with a minimum of noise or discomfort. The line includes pickup models with new 7 and 8½-ft long bodies, panel, stake, travelall, service-utility, and multi-stop-delivery models. The A-100 pickup comes in white and gold, symbolic of the golden anniversary of IH trucks production.—**International Harvester Co., 180 N. Michigan Ave., Chicago, Ill.**

Buy your excavator like you'd make ANY investment and you'll buy BUCYRUS-ERIE

in·vest'ment (ĭn·vĕst'mĕnt), *n.* the investing of money or capital in order to secure profitable returns . . .

No matter how you look at it, your investment in a Bucyrus-Erie excavator measures up . . .

PROFITABLE RETURN

You know you can expect profitable returns from a Bucyrus-Erie excavator — just as generations of loyal owners have.

INCOME DEPENDABILITY

A Bucyrus-Erie excavator stays on the job, continues to earn. Each model is engineered and built from boom point to mounting for a specific rated capacity. There's no overdippering to create "new" models, no overpowering that shortens the useful life of the machine by excessive wear.

LOW DEPRECIATION

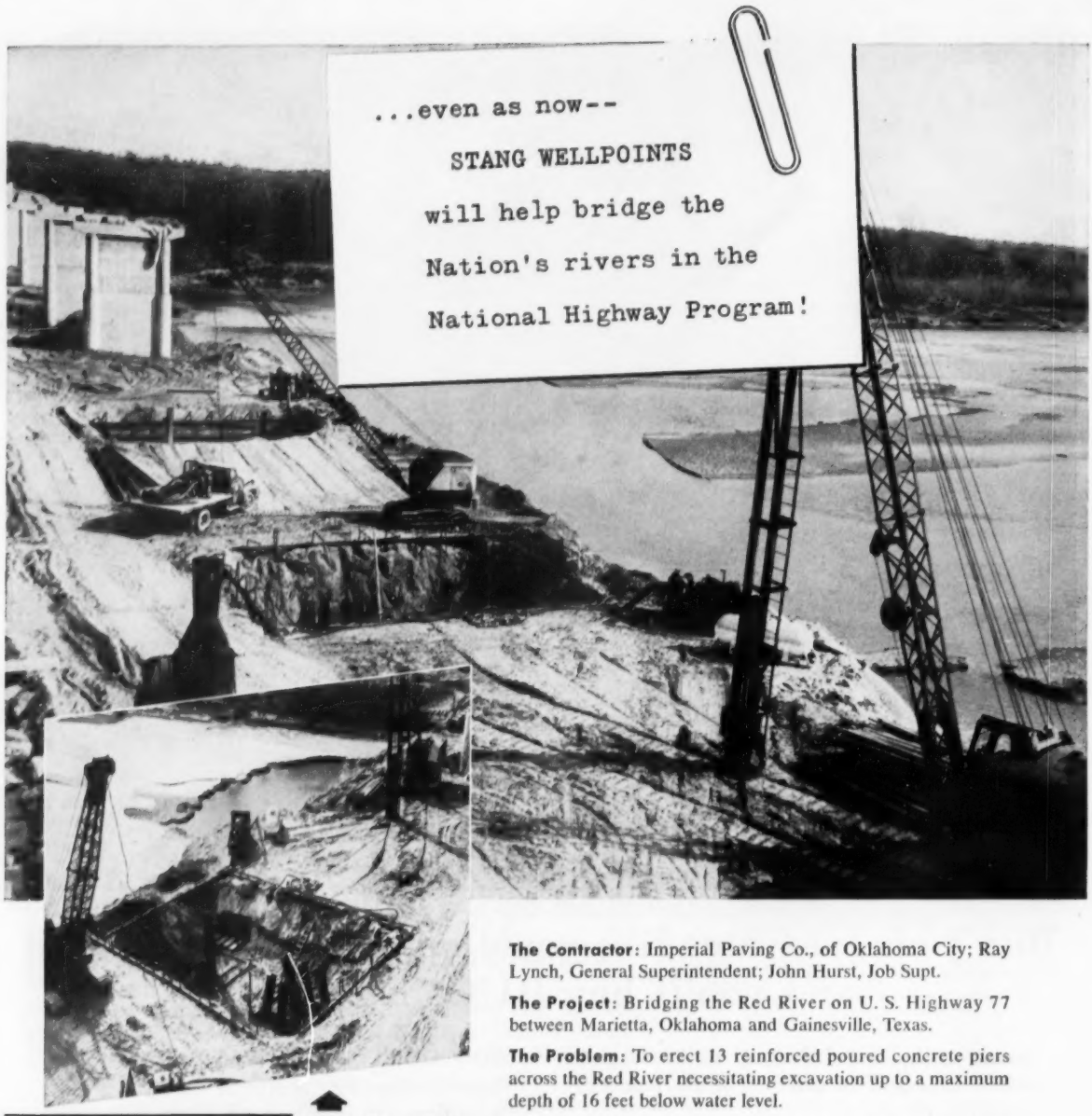
Your Bucyrus-Erie excavator *stays young* with a minimum of maintenance, keeps its original performance values for many years of money-making service. That means high resale value, too. Simple design and strong, large parts — few in number and easily accessible — assure ease and economy in upkeep. Main machinery is securely anchored on one-piece frame, keeps perfect alignment.

RELIABLE COUNSEL

Your Bucyrus-Erie distributor will be glad to help you select the right machine for your specific requirements from the complete line, ⅜ to 4 cubic yards. 335E57

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN



The Red River bridge is a joint Texas-Oklahoma project under the direction of the Texas Highway Department, Mr. John G. Simpson, resident engineer.

GENERAL PUMPING including High Pressure Jet Pumps, Large Capacity Sump Pumps (vertical or horizontal), Hydraulicking and Sluicing Systems and Sprinkler Irrigation Equipment.

Write for bulletin 100

The Contractor: Imperial Paving Co., of Oklahoma City; Ray Lynch, General Superintendent; John Hurst, Job Supt.

The Project: Bridging the Red River on U. S. Highway 77 between Marietta, Oklahoma and Gainesville, Texas.

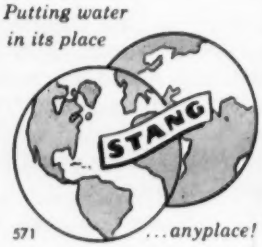
The Problem: To erect 13 reinforced poured concrete piers across the Red River necessitating excavation up to a maximum depth of 16 feet below water level.

The Solution: Installing a Stang Wellpoint system progressively around each pier location on a previously constructed earthen dyke thus lowering the ground water level to the required depth.

Result: A completely dry working area in a water-saturated riverbed making possible a *time-saving and profitable job!*

Call on STANG engineers for experienced services and special equipment to solve your water handling problems—any size, any type, *anywhere!* STANG engineers are on call in your area for consultation day or night.

Putting water in its place



571 ...anyplace!

JOHN W. STANG CORPORATION

Engineers and Manufacturers of Dewatering Equipment, Wellpoint and Pumping Systems
Dewatering Planning—Equipment—Service

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8221 Atlantic Avenue	2123 South 56th Street	2339 Lincoln Avenue	4026 South Urbana Street
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NEW WRIGHT Type "C" Pull-A-Ways

THREE SIZES—1½, 3 and 6-Tons

FEATURES

- Lubricated for life
- Hooks are drop-forged
- Special alloy-steel chains
- Chain sheaves of drop-forged alloy steel
- Gear teeth cut to precision limits
- Load brake is dependable and safe
- Weights: 1½-ton, 23½ lbs. 3-ton, 36½ lbs. 6-ton, 63 lbs.

Write to York, Pa., office for complete information

ACCO

Wright Hoist Division
AMERICAN CHAIN & CABLE
York, Pa., Bridgeport, Conn.

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330 W. 42nd St., New York 36, N. Y.
(5-57)

New Publications

These catalogs and bulletins from manufacturers contain useful information about construction equipment and materials. To obtain a copy, write directly to the manufacturer at the address given.

QUICK STARTS—General Motors' new and improved version of the Hydrostarter, which provides quick starts for diesel engines and cuts down on maintenance of batteries, cables, magnetos, and air compressors, is described in a new brochure just issued by GM's Detroit Diesel Engine Div. Hydrostarters are now installed on equipment used in over 1,000 different applications. — **Detroit Diesel Engine Div., GMC, 13400 W. Outer Drive, Detroit 28, Mich.**

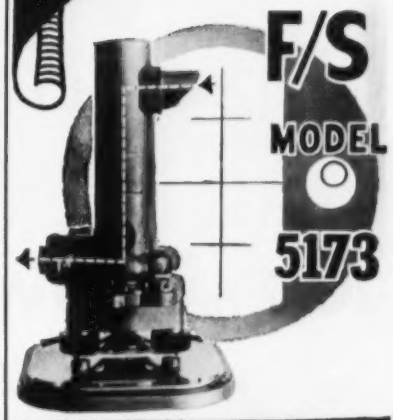
BATCH PLANT LINE — Standard Steel's line of semi-portable asphalt batch plants, ranging in capacity from 2,000 to 6,000 lb, is described in a new 16-p bulletin. Another bulletin describes in detail the TM Mobile Mixer, a 2,000-lb capacity self-contained unit that can be erected in less than 30 min and ready to produce asphalt mix in a few hours.—**Standard Steel Corp., 5001 S. Boyle Ave., Los Angeles 58, Cal.**

HOSE AND FITTING CATALOG—A new condensed catalog lists the various types of Aeroquip hose, fittings, Socketless kits, and self-sealing couplings. Prepared for use when ordering replacement parts, the catalog is an abbreviated version of the complete Aeroquip catalog. It includes instructions on ordering and assembly of Aeroquip hose and fittings.—**Aeroquip Corp., Jackson, Mich.**

HARDFACING DATA — A new folder describing the various hardfacing wires available for semi-automatic applications has been issued by Stoody. It contains data on welding characteristics, suggested used of the 11 wires listed, and some general information on the semi-automatic welding process.—**Stoody Co., Whittier, Cal.**

SAFETY TALKS — "Five Minute Safety Talks for Foremen" is the title of a new booklet prepared for the National Safety Council by Roland F. Blake, a leading safety engineer. The five-minute talks

LOOK HERE



AUTOMATIC LEVEL

Now you can get a reliable precision instrument, WORKING 3 TIMES FASTER THAN A CONVENTIONAL LEVEL —and . . . no complicated adjustments . . . no variations caused by changes in temperature!

F/S AUTOMATIC LEVEL 5173 FEATURES:

- 24X Periscopic Telescope
- Pendulum unit for self-leveling
- Viewing of bull's-eye level through telescope eyepiece

ERECT IMAGE

- Built-in Sunshade
- Sliding-leg Tripod with shifting head

18 MONTHS GUARANTEE
FULL SERVICING BY FACTORY SPECIALISTS

ACCURACY: 0.025 ft. per mile
(can be improved to 0.010 ft./mile with Micrometer 5180—optional—allowing rod readings to 1/5000 ft. without targets)

PRICE OF AUTOMATIC LEVEL 5173—$450 including metal case and tripod.

F/S DISTRIBUTORS: The A. Lietz Co., San Francisco & Los Angeles, Cal.,—National Blue Print Co., Chicago, Ill.—J. E. Reagan Co., Denver, Colo.—Watts Instruments, Columbus, Ohio.

CANADA: Instruments 1951 Ltd.—Ottawa—Toronto—Regina—Montreal.

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FILOTECNICA SALMOIRAGHI INC.
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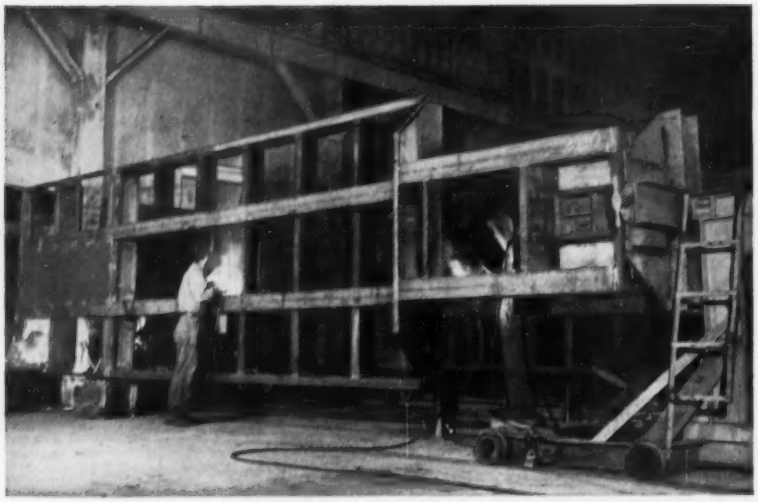


100% "DOWN-WELDED"

for your protection

One weak weld in the main frame of a low-bed trailer can cost you hundreds of dollars in down-time and repairs — if it happens to "let go" with an expensive shovel or tractor aboard!

That's why LaCrosse fabricates its trailer frames in giant frame-positioners, which *revolve the entire frame*, so all welding is performed in the most favorable *downward* position. This special LaCrosse method of quality control insures *much stronger, more uniform welds* than are obtainable with ordinary methods used by most low-bed manufacturers.

LaCrosse also *forms* all of its trailer main beams — without cutting either flange — so you get continuous beam strength from stem to stern. This patented method also gives you *far more strength in the gooseneck*, where most of the jolting, twisting strains occur in low-bed operation. See your LaCrosse distributor, or write for free literature describing the many additional quality features of LaCrosse low-beds — from 6 to 75 tons capacity. LaCrosse Trailer Corp., LaCrosse, Wis., U.S.A.

Most popular low-bed in the field is the *24-ton capacity* LaCrosse DF6T tandem because it hauls a bigger variety of loads ANYWHERE — *without permit complications*. Weighs only 8800 lbs. with flat deck.

LaCrosse also builds four different types of single and tandem-axle *tilt-trailers* — from 6 to 22 ton capacity — for fast, one-man loading and hauling of small tractors, shovels, etc., behind trucks or 5th wheel tractors. LC-40

Heavy metal fabricating since 1865

"Better Living Through Better Roads"

LaCROSSE

VALUE LEADER IN LOW-BED TRAILERS

come with an outline and a text that the supervisor can use for either informal or scheduled training session. The booklet contains material on such varied topics as vacation safety, smoking, how to use a screwdriver, and hot weather hints. — **National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.**

THREE-WHEELERS—Design features and the various applications of Huber-Warco three-wheel rollers, both standard and variable weight models, are described in a new catalog. The bulletin is divided into sections that describe and illustrate the main frame, the live suspension of the sub-frame, the torque converter, tail shaft governor, two-speed transmission, and the adjustable guide roll assembly. —**Huber-Warco Co., Marion, Ohio.**

CONCRETE FORMS—Metal Forms Corp., manufacturers of steel forms for concrete construction since 1904, has issued a 20-p general catalog. The booklet contains design details and illustrations covering curb and gutter, road, building, and circular tank and manhole forms.—**Metal Forms Corp., 3300 N. Booth St., Milwaukee, Wis.**

WELDING DATA—The 11th edition of the "Procedure Handbook of Arc Welding Design and Practice" is a major revision of the Lincoln Electric Co.'s well-known arc welding reference book. Over 400,000 copies of the Handbook have been printed to date. The book's content ranges from the early history of arc welding to the intricities of structural design. One section presents information on how to weld all of the commonly welded metals. The 465-p structural section has been completely rewritten and includes the latest data on welded design. The book, which contains over 1300 pages and over 1100 illustrations and charts, sells for $3.00 in the U.S. and $3.50 elsewhere.—**The Lincoln Electric Co., Cleveland 17, Ohio.**

SELF-PROPELLED COMPRESSORS—"No Contractor Can Afford to be Without Self-Propelled Air Compressors" is the title of a new 6-p bulletin that describes and illustrates the versatility of Schramm's Pneumatractor, a combina-

Roadbuilders!

START WITH ONE PAVER...
GROW with the BUTLER TX-4!

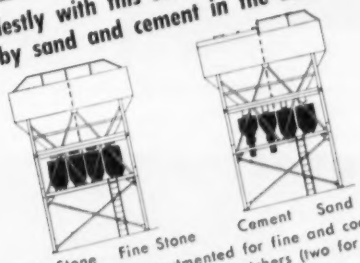
New Butler One-Man Batching System
Matches 1, 2, 3 or 4 Dual Drum Pavers

The New Butler TX-4 Roadbuilder Plant offers you ONE MAN operation with ultra-high speed automatic batching — no matter if you operate one paver — or two . . . or three . . . or four . . . or more!

Typical automatic TX-4 bin and batcher. Controls are pre-set on each bin, operate by push-button.

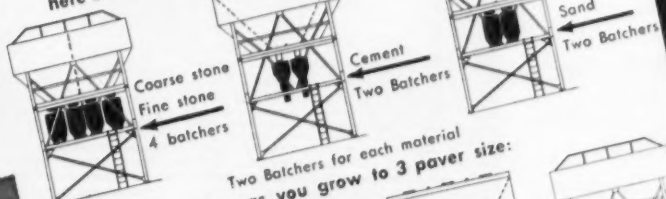
You can start modestly with this set up if your operation is best served by sand and cement in the same bin

1 or 2 pavers



Basic Unit. One bin compartmented for fine and coarse stone, the other for cement and sand. Eight batchers (two for each material) easily keep pace with one or two pavers.

Where separate bins are desirable for sand and cement, here's the one and two dual-drum paver set up.

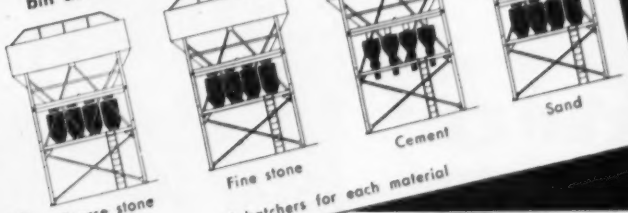


Two Batchers for each material

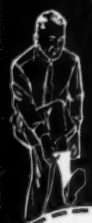
Now as you grow to 3 paver size:

3 and 4 pavers

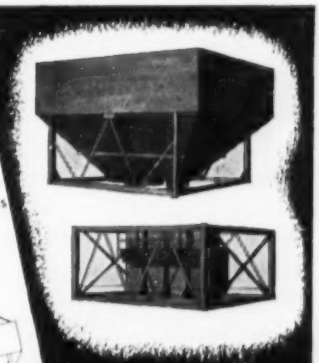
4 bins are equipped with 3 batchers for each material to handle 3 pavers. Then when you want production for 4 dual drum pavers you just add a batcher to each bin as shown below.



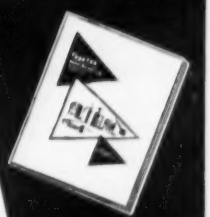
4 batchers for each material



So no matter how modest or how large your paving operation, the versatile, highly portable, completely automatic Butler TX-4 fits your requirements like stretchable socks.



TX-4 is the most portable ever designed. Bins complete'y pre-assembled for easy crane handling. Batcher units handled with piping and wiring in place.



The Butler TX-4 is described right down to the nuts and bolts in this fact-packed Bulletin. Send a post card today. Just ask for Bulletin TX-4.

BUTLER BIN COMPANY
949 Blackstone Ave. • Waukesha, Wisconsin

Steel Bridge Floor Gives New Life to Old Bridges

When the old flooring of the three bridges shown here needed replacing, the bridges were stripped to the stringers, repairs made and new decks of Bethlehem Formed Steel Bridge Flooring laid down. Result: strong, smooth, rattle-proof bridge floors, requiring little or no maintenance.

In each case, Bethlehem Formed Steel Bridge Floor was easy to install. First, the worn planking was removed, then the Bridge Flooring was carried from the stockpile, where it nested compactly in small piles, to the bridge. After proper positioning, the 2-ft-wide corrugated steel plates were welded to the stringers, and adjacent plates welded together. In the case of wooden stringers, the steel floor is easily attached with lag screws and washers.

After a surfacing material was applied, the new bridge floors met all strength specifications of the American Association of State Highway Officials' standard specifications for highway bridges.

For complete information on Bethlehem Formed Steel Bridge Flooring write or phone the nearest Bethlehem sales office.

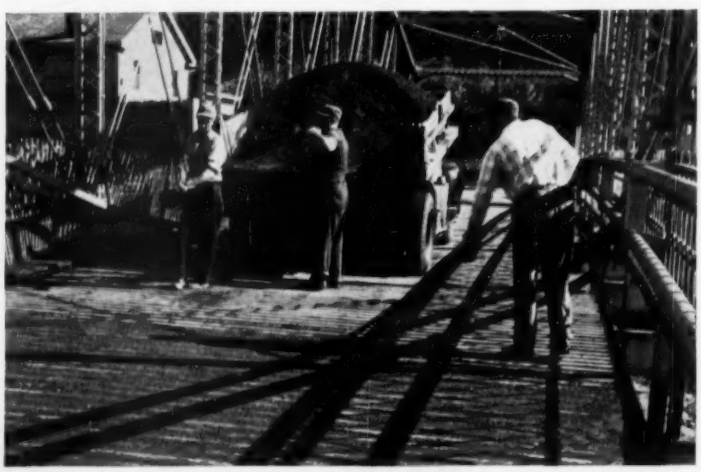
BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

Steel bridge floor over the solid wood stringers of this rural Tennessee span resulted in a strong bridge.

The Bethlehem bridge floor over this bridge in Pennsylvania will require very little maintenance.



Applying the first surface course on a rural Connecticut bridge. A second wearing course is also applied.

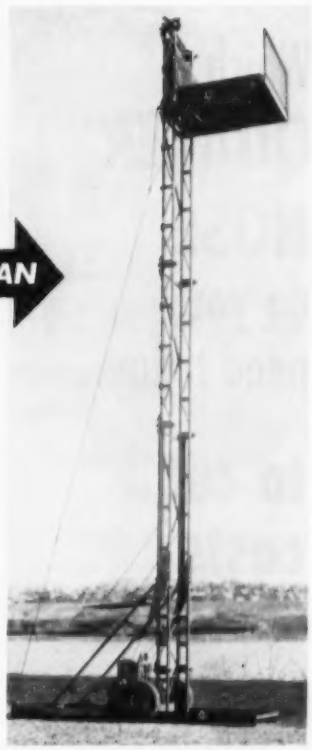
NEW PUBLICATIONS . . .
continued

tion 125-cfm air compressor and wheel tractor. Photographs show 18 different ways contractors have used the Pneumatractor. Some applications are power shoveling, breaking out concrete, trenching, grading, rock drilling, towing, sweeping, tamping, pumping water, and plowing snow. Specs are given for both the standard and heavy-duty models. — **Schramm, Inc., 900 E. Virginia Ave., West Chester, Pa.**

ENGINEERING TIME SAVERS— A 4-p illustrated report has been issued by Bendix describing in detail how Bendix digital computers have been used to save time on highway earthmoving computations. The total cut and fill requirements of 230 cross sections of a 3-mi. strip of parkway—solved in 45 min. for $38.80—is cited as an example of their value.—**Bendix Computer Div., Bendix Aviation Corp., 5630 Arbor Vitae St., Los Angeles 45, Cal.**

PILE HAMMER USES — A new bulletin published by McKiernan-Terry Corp. contains information on the evolution and uses of the various types of pile hammer leads. It lescribes the basic lead types and presents tabular data on weights and specifications of leads and accessories. The following types are covered: Swinging, underhung, vertical, underhung 6-to-1 and 3-to-1 fore and aft batters, extended four-way batters, and railroad pile driver leads. Information on each item includes its use, the type of pile it can handle, and its advantages and disadvantages.—**McKiernan-Terry Corp., 100 Richards Ave., Dover, N.J.**

CAT HISTORY — Caterpillar engineering "firsts" are described in a new booklet called "A Quarter Century of Diesel Leadership." The story traces the history of Caterpillar diesel engines since Cat's entrance into the field in 1931. Among the subjects discussed are the Caterpillar fuel injection system, the development of detergent oils, the induction hardening of cylinder liners and camshafts, and the use of aluminum alloy main and connecting rod bearings. Photos illustrate early model Cat engines that are still on the job. Also shown is the company's current line of diesel engines.—**Caterpillar Tractor Co., Peoria, Ill.**



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with a Portable
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Speed and ease of erection—and ease of operation—save construction time and labor. So well balanced — efficiently designed — one man can erect this Buck Heavy-Duty Hoisting Machine. ACTION at 45 feet with a 2,000 pound load at one job—and ACTION the same day at another.

Contact one of the 73 Buck Dealers serving you or write direct:

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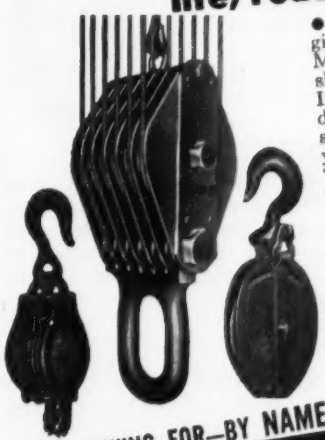
Correctly engineered to bear heavier loads, lengthen rope-life, reduce maintenance costs



• Because they're designed and engineered for specific tasks, you'll find MADESCO blocks with heavy steel shells and fittings your *safest* choice. In materials, in construction too, Madesco tackle blocks assure you the extra service that comes from over thirty years of specialized experience and "know-how." Buy Madesco blocks and you make substantial savings on your rope costs, because Madesco sheaves (of iron or steel graphite bronze) are correctly-grooved to prolong rope-life. Loads travel smoothly, easily, quickly to save lifting time; that means savings too that come from minimized maintenance and down-time. There's a complete line of Madesco tackle blocks for every need. Consult your industrial distributor—and meantime write for our catalog.

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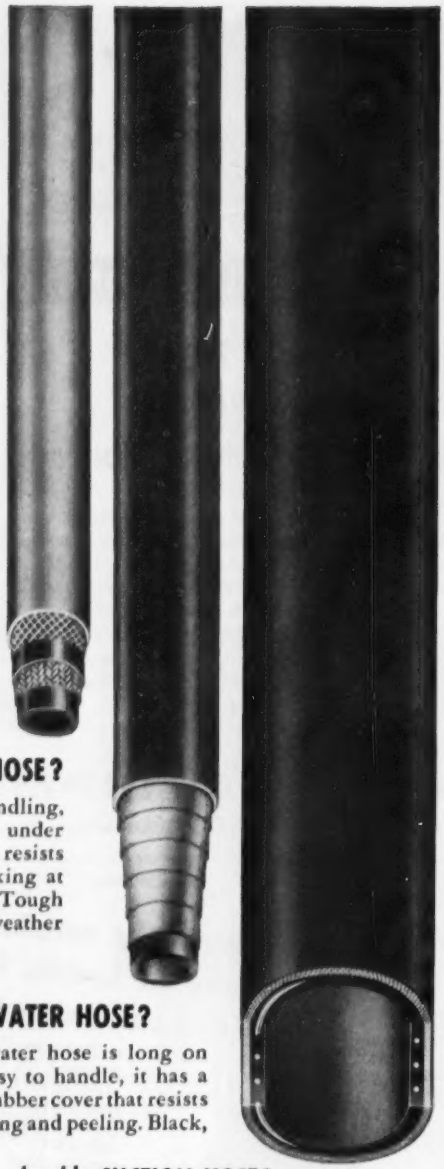
MADESCO BLOCKS
MADESCO TACKLE BLOCK CO., Easton, Pa.

Which QUAKER HOSE do you need today...

to cut costs tomorrow?



Rugged, non-twisting AIR HOSE?

Though lightweight for easy handling, this hose won't snake or twist under pressure. It takes dragging . . . resists oil damage . . . withstands cracking at temperatures as low as 20°F. Tough Neoprene cover withstands all weather conditions.

Easy-to-handle WATER HOSE?

This all-purpose water hose is long on wear and value. Easy to handle, it has a black, high-grade rubber cover that resists sun, weather, cracking and peeling. Black, non-porous tube.

Strong, durable SUCTION HOSE?

Here's a rugged, long-lasting hose for conducting water under pressure or suction. It resists kinking and crushing and has good sun, weather and abrasive-resistant qualities. Tube resists action of water containing light concentrations of alkalies, acids, grit and sand.

THESE are but a few of the many types of air, water and suction hose your Quaker-Quaker Pioneer distributor has on hand and ready to go. Call him—whatever your needs. For free brochures, write: *H. K. Porter Company, Inc., Quaker Rubber Division, Phila. 24, Pennsylvania, or Pittsburg, California.*

HKP QUAKER RUBBER DIVISION
H. K. PORTER COMPANY, INC.

SOME BIG CONTRACT AWARDS OF THE MONTH

S. N. Nielsen Co., 3059 W. Augusta Blvd., Chicago, Ill. Two-unit electric generating plant, Buffington Harbor, East Chicago, Ind. Northern Indiana Public Service Co., 5265 Hohman Ave., Hammond, Ind. $40,000,000.

United Engineers & Constructors, Inc., 1401 Arch St., Phila., Pa. Design and construct expanding steel plant, including 100-ton electric furnace, ingot and slab soaking pits, four-high 140-in. breakdown mill, Coatesville, Pa. Lukens Steel Co., Coatesville, Pa. $33,000,000.

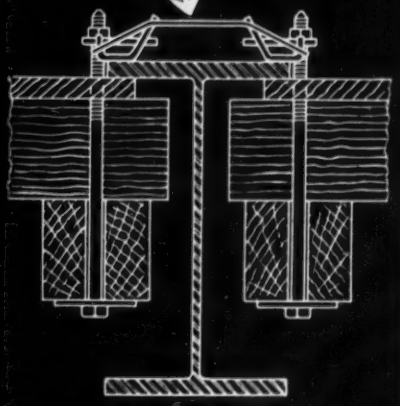
R. A. Westbrook, Morrison-Knudsen Co., Inc., & H. Earl Parker, Inc., 6431 Elvas Ave., Sacramento, Calif. Primary runway (concrete) and related facilities at Beale Air Force Base, near Marysville, to convert it into Strategic Air Command Heavy Bomber Base, ENG-04-167-57-42, Beale Air Force Base, Calif. U. S. Eng., 1209 8th St., Sacramento, Calif. $10,261,-686.

The Austin Co., 16112 Euclid St., Cleveland, Ohio. Design and construct four-story glazed brick, limestone, aluminum and glass plant and office bldg., air-conditioned, E. 9 and Lakeside Ave., Cleveland Ohio. The Cleveland Press, Rockwell and E. 9 Sts., Cleveland, Ohio. $10,000,000.

Bero Construction Corp., 259 Delaware Ave., Buffalo, N.Y. Construct 1.24-mi six-lane divided portion of State Thruway's Niagara Section in Buffalo from point west of Peabody St. to point east of Louisiana St. including seven span 576-ft viaduct over Selkirk St. and four railroad lines, grade separation structure at Smith St., Van Rensselaer St. and Hamburg St. and two other overpasses over railroads, Erie County for The Department of Public Works, The Governor Alfred E. Smith State Office Building, Albany, N.Y. $6,441,677.

Coleman Bros. Corp., 85 Sprague St., Readville, Mass. Constr. sect. South East Expressway, Contr. C, FA-U 254C1, Boston, Mass. Commonwealth of Mass., Department of Public Works, 100 Nashua St., Boston. $6,198,813.

Faster Adjustment from TOP of Deck



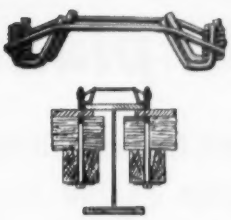
TOTAL SAFE LOAD ON BOTH COIL BOLTS IS 10,000 LBS., OR 5,000 LBS. PER BOLT

..WHEN HANGING FORMS WITH SUPERIOR PLATE HANGER FRAMES

With Superior Plate Hanger Frames the installation and necessary adjustment to bring the deck forms tight against the flange are from *above* the deck. Coil Bolts are passed through and secured from above with coil nuts. Bolts are easily removed without binding because, (1) nuts are square and will not turn; (2) embedment of the bolts in the concrete is at a minimum since the plate is only ½" above the flange.

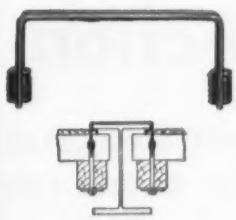
FOUR OTHER SUPERIOR WAYS TO HANG FORMS FROM STEEL BEAMS AND GIRDERS ON BRIDGE SUPERSTRUCTURES

STANDARD COIL HANGER FRAME



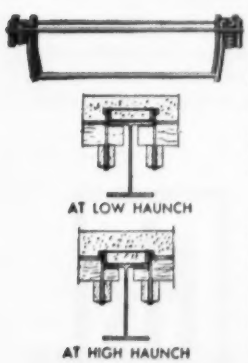
When hanging forms where specifications do not permit any hanger wire to be exposed after stripping, use Superior *Standard* Hanger Frames. Detail at left shows their use with double ledgers, ½" coil bolts, and flat washers. Total safe load on both bolts for Type 10M is 10,000 lbs., or 5,000 lbs. per bolt. For Type 6M, total safe load on both bolts is 6,000 lbs., or 3,000 lbs. per bolt.

COIL BEAM SADDLE



On jobs where hanger wires may be cut after stripping the forms, use Superior Coil Beam Saddles. The Coil Bolts allow for any variation in lumber and flange thickness and tightening the bolts pulls the forms tightly against the flanges. Forms are easily stripped. Safe load is 6,000 lbs. per saddle, or 3,000 lbs. for each ½" Coil Bolt. Coil Beam Saddles are also furnished for ¾" and 1" bolts.

SPECIAL HANGER FRAME

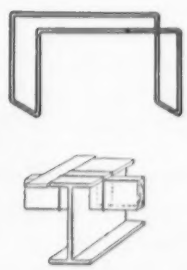


AT LOW HAUNCH

AT HIGH HAUNCH

The design of certain bridge superstructures allows for the permanent deflection of the beams or girders due to the pre-calculated dead load. This deflection is compensated by a concrete haunch of varying depth on the upper flange. Superior *Special* Coil Hanger Frames were developed to meet this field condition, at the same time avoiding any exposed hanger wire. The extent to which the ½" coil Bolts are threaded into the coils allows for these varying haunch depths from maximum to zero. (See detail). Total safe load per frame is 10,000 lbs., or 5,000 lbs. per ½" bolt.

WIRE BEAM SADDLE



Wire Beam Saddles are used to hang centering joists from structural steel beams when the beams are not fireproofed with concrete. On non-fireproofed structures the load is determined by the allowable spacing of centering joists rather than the capacity of the hanger. Available in three gauges and sizes as required. Will carry safely, total loads of 2,500 lbs. to 6,000 lbs. Layouts and estimates will be sent upon receipt of plans or quantities. No obligation.

WORKING PARTS (Bolts and washers) are returnable. Layouts and estimates for Superior Hangers are available without obligation.

SUPERIOR CONCRETE ACCESSORIES, INC.

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88,000 BOLTS

speed erection of "BIG M" plant

The Pacific Iron and Steel Corporation of Los Angeles used Ingersoll-Rand *Torsion Bar* Torque Control Impactools exclusively to run 88,000 high tensile steel bolts in the erection of the new Mercury plant in Los Angeles.

Here's Why Bolted Construction is Preferred.

Faster—twice as fast as riveting—one riveting crew can be divided to make two bolting crews.

Safer—no heating and tossing of rivets.

Stronger—high strength bolts provide considerably more clamping force than rivets . . . friction-type joint is superior to shear-type.

Call your Ingersoll-Rand Office for a demonstration of the New Torsion Bar Torque Control Impactool.

Here's Why Torsion Bar Torque Control Impactools are Preferred.

Positive Torque Control—steel Torsion Bar assures precision control of torque—minimizes inspection.

Cannot "Over Torque" Bolts—tool automatically shuts off when preset torque in Torsion Bar is reached.

Adjustable Torsion Bar—easily changed to meet the requirements falling within its range.

Easy to Operate—no training is necessary.

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Low Maintenance—periodic lubrication will keep the tool on the job indefinitely—there's no clutch to slip or wear.

18-586

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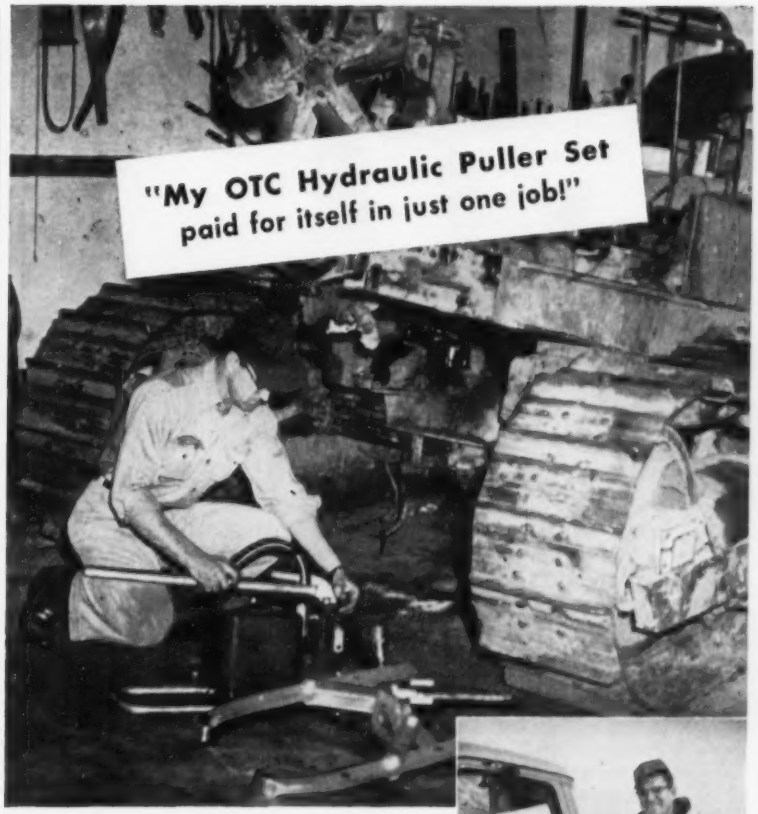
help your HEART FUND help your HEART



. . . SAYS CONTRACTOR LOREN LEAS, LUANA, IOWA

"Running 4 tractors, a scraper and 2 trucks, we can't afford costly time and money losses from breakdowns. Before OTC we often waited from 5 hours to 3 days for service (the nearest repair facility is 100 miles away). Now—with an OTC Power-Twin ram and pump plus attachments—we do virtually all our general and emergency maintenance immediately—in the shop or in the field.

"On one job alone the OTC pulling unit paid for itself."

You too can save money, time, tools, parts — portable OTC Power-Twin Hydraulic pulling system, powered by a 50- or 100-ton ram with hand, electric or gasoline pumps. Add adapters and attachments to fit your equipment—then pull, install sprockets, gears, sheaves, pulleys, bearings, kingpins—on tractors, trucks, heavy machinery.

REMOVE SPROCKETS QUICKLY . . . SAFELY

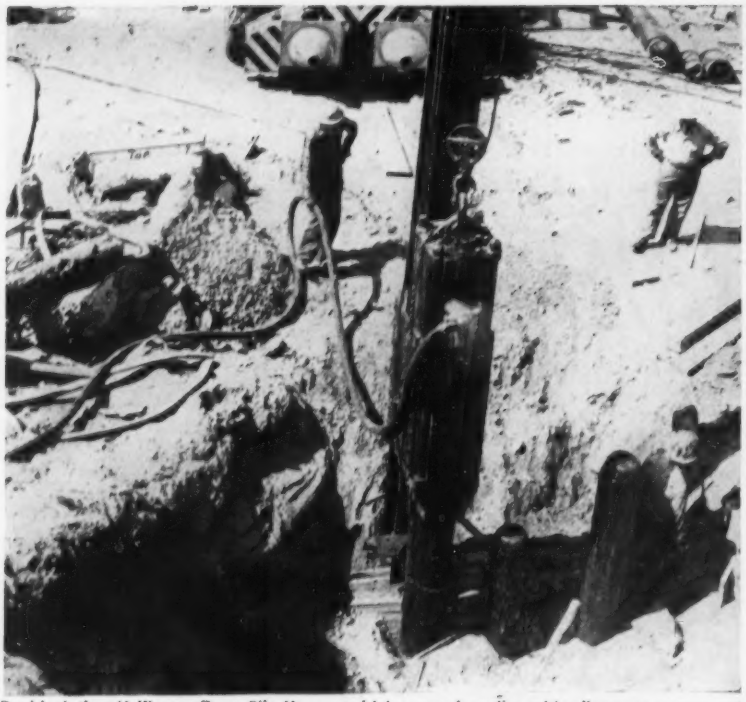
Takes only **minutes** to remove sprocket from Caterpillar D6 with OTC 50-ton ram and accessories. No danger of sprocket breakage.

OTC tools are factory-approved by LeTourneau-Westinghouse, Allis-Chalmers, International Harvester and other leading manufacturers.

Send for new manual—or service bulletin covering your tractor.

OTC **OWATONNA TOOL COMPANY**
380 Cedar Street — Owatonna, Minnesota

(Advertisement)



Double-Acting McKiernan-Terry Pile Hammer driving wooden piles with alignment maintained by means of an H-beam spud and grapples fastened to the sides of the hammer. This method of holding a pile hammer is facilitated by the all-enclosed McKiernan-Terry design. McKiernan-Terry Corporation, 110A Richards Ave., Dover, N. J.

. . . big D-6 bulldozer loads in just 2 *minutes* . . .

. . . on MILLER "OT"-13 DUAL TANDEM *Tilt-Top*

Model "OT"-13 tandem $2,295.00*

. . . and it takes only ONE man to do it!

You get all the speed . . . the easiness of Tilt-Top* loading . . . combined with the BIG LOAD capacity of a low boy on MILLER'S "OT-13" dual tandem. Whatever you haul . . . dozers, pavers, trenchers, front-end loaders or backhoes, you'll load them faster . . . slash between-job-hauling time with a MILLER Tilt-Top! The "OT-13" 's over the wheel's platform provides a full 8 ft. width and nearly 17 ft. in length. Independent acting walking beams are mounted on trouble free Timken roller bearings . . . minimize jarring on rough ground. Save the cost of slower loading, more cumbersome trailers . . . with a Tilt-Top to suit your needs. Several different models from 3 to 13 tons capacity—all provide ONE man TWO minute loading. See these time saving, production boosting Tilt-Tops at your MILLER distributor today!

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Complete with platform and tires. Any optional equipment extra.
Plus 10% Federal Tax

✓ **built best**
✓ **priced best**

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Tilt-Top Trailer Inc.
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The construction of modern highways utilizes many and varied engineering skills and techniques. One of these skills, the use of specialized explosives and blasting methods, helps to speed completion of these arteries so important to our economic development.

The efficient use of industrial explosives levels hills, fills valleys, drives tunnels, and straightens rights-of-way to make the highways of tomorrow wider and safer.

Hercules has pioneered in the development of improved explosives and blasting techniques for more than 40 years. Whatever your blasting problem may be, Hercules has the right explosives and technical representatives to help you do the job quickly, efficiently, economically. We'll welcome an opportunity to consult with you.

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HERCULES

• $1,300,000, five-story municipal garage in Copley Square, Boston is one of **S. & A. Allen's** recent projects. It will take 800 cars off the streets of Boston.

"Construction Daily Helps Us Locate Jobs We Are Eager To Bid On"—

Says S. & A. Allen Construction Co.

"Through Construction Daily we are able to get sufficient information, enough in advance, to tell our story to prospective clients so that we are placed on their invitation-to-bid lists. In the last six months, as a direct result, we have been invited to bid on six jobs, all over a million dollars." That's Samuel Allen talking. He's president of the S. & A. Allen Construction Co., in Boston, Mass.

President Allen gets Construction Daily first thing every morning. After he has digested it, he routes it to his son, Edward E. Allen, vice president of the firm. Reports are then sent to the estimating department. Listen to what Ed Allen has to say: "We make constant use of the Daily as a source of planned construction projects, especially on private work. The Backlog of Proposed Work section is invaluable in this respect. This section by itself would make the Daily a sound investment. However, we also find the price reports and business condition reports useful, and make occasional reference to the tables showing volume of construction in each state."

The Construction Daily can help you build business, too. Published every working day of the year, it includes two separate publications — the Daily Newsletter and the Construction Reports. The Newsletter is a quick two or three pages of highspot news, newly announced bid dates, proposed new work reports, price information, economic news, reports from Washington and other fast-breaking news that keeps you a step ahead of your industry. The Reports section includes bids asked, low bids, and contract awards on more than $80,000,000 worth of business every day. It is the fastest, most complete system of reports on heavy construction in the nation.

Construction Daily can arrive on your desk every morning, delivered air mail west of the Mississippi. It can give you a big jump on new business opportunities and changes in business conditions that will pay off in new contracts, and in time and money saved on current projects. A full year's subscription to this specialized news service costs only $175. Quarterly subscriptions are available at $50 for three months. Write now for complete details.

About S. & A. Allen Co. . . .

The S. & A. Allen Construction Co., was founded in 1916 by Samuel Allen. After World War II, his sons Alvin and Edward joined the firm as treasurer and vice president, respectively. Always a building contractor, the firm has expanded in the past decade into almost every phase of building construction. It has completed multi-million dollar contracts for schools, housing developments, industrial buildings, churches, theaters, recreation and community centers, military installations, retail stores and supermarkets.

Among the more recent contracts are the control tower at Logan International Airport, a community center in Brookline, Mass., Sharon Elementary School, the Electronics Building at Charleston Navy Yard, Old North Church in Marblehead, and a NIKE site at Hingham. The firm is presently inaugurating an aggressive promotion program, built around the Construction Daily, to attract new business to continue its growth.

Construction Daily
A McGRAW-HILL PUBLICATION

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START NOW TO REDUCE INSURANCE COSTS
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Paving Maine Turnpike Extension which now carries traffic from Kittery to Augusta. Insurance costs can spell profit or loss on jobs like this.

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AJAX CUPS can help you here . . . because they put their imprinted safety messages right in your workers' hands, at just the moments when they're relaxed, receptive, ready to read. And at no extra cost to you.

What's more! – AJAX Cups and Drinking Equipment provide the safest, cleanest, most welcome way to take fresh drinking water to your men in the field.

So why don't you get the two-way protection of AJAX complete drinking water service on your next job?

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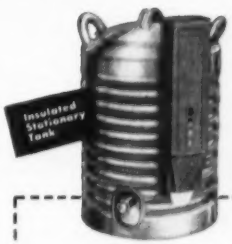

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Let your Allis-Chalmers dealer show you how the Model D can measure up to your standards of grader performance . . . at low cost. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS *Engineering in Action*

Methods Memo...

New BPR Division

The Bureau of Public Roads has established a Division of Development under H. A. Radzikowski, a veteran BPR official.

The new Division will handle BPR development work and encourage the integration of industrial research and development into the highway programs of the Bureau, the states, and other federal agencies.

Its work will include devising ways of applying to highway construction the new developments in electronics, electronic computers, aerial photography and photogrammetry, and construction equipment. It also will try to clarify and simplify highway construction and maintenance plans and operations.

Safety Award

CONSTRUCTION METHODS has been named to receive one of the 1956 Public Interest Awards presented by the National Safety Council for "exceptional service to safety."

The Council makes these awards each year to newspapers, magazines, radio and TV stations, and advertisers. CM&E also won one of the 1955 awards.

Our editors take a great deal of pride in the plaque that accompanies the award, but we also agree wholeheartedly with this paragraph in the letter to us from Ned H. Dearborn, president of the Council:

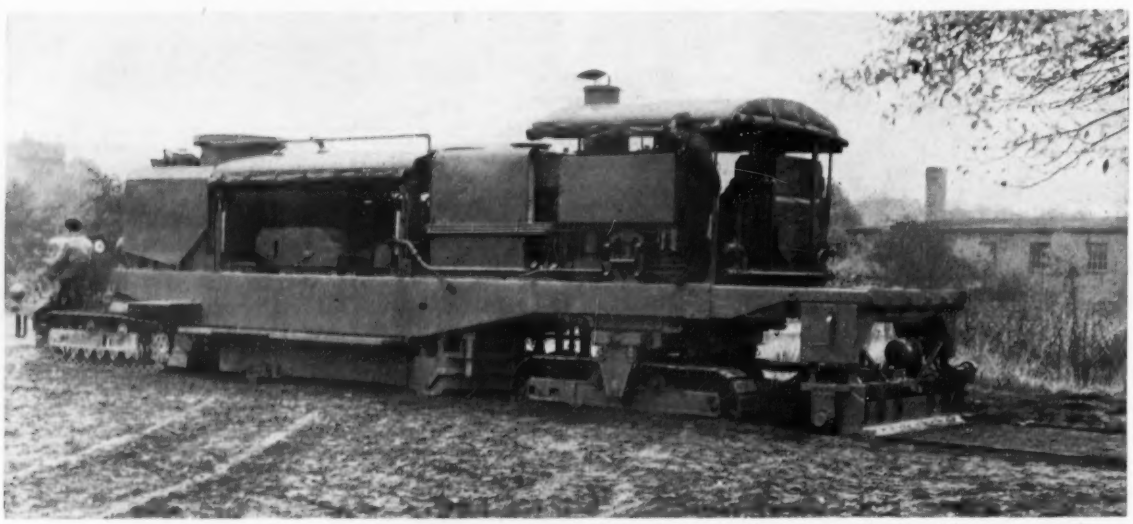
"I am sure you feel, as we do," he wrote, "that there is another, less tangible result of your safety efforts—the knowledge that you have helped prevent many accidents."

Rain in the Sunshine State

Florida's brand new Sunshine State Parkway, just opened to traffic January 25, is showing signs of pavement distress in one 11-mi section.

Howard, Needles, Tammen & Bergendoff, consulting engineers for the project, say the fault is in the low optimum moisture content of the limerock base in this section. It became plastic and unstable after heavy rains during the final stages of construction and during February.

To repair the damage, the Florida Turnpike Authority has cut small, shallow ditches along the edge of the roadway to bleed free water from under the asphaltic binder course and covered undamaged portions—or those with only minor damage—with an asphaltic seal to prevent additional moisture intrusion into the base. When the surface is repaired, an effective seal and a denser bituminous mix will be placed to insure against future water seepage.



This Paver Does Everything

This versatile German machine is the latest refinement in paving equipment. Eduard Linnhoff of Berlin, the manufacturer, claims it can lay up to 1,000-ft of mixed-in-place concrete or asphalt pavement per hour in one operation.

The tractor-driven rig rolls on crawlers at working speeds of up to 8 mph. It breaks up ground to a depth of 1 ft, lifts the soil into a mixing chamber where it is crushed and mixed with water and cement (or asphalt), and then places and screeds the mix.

It is 36 ft long and weighs 33 tons. It builds pavements in widths of 7 to 9 ft. The rig moves forward or in reverse at the same speeds and requires two operators, one at each end. It is powered by two air-cooled Deutz diesel engines. For road transport, the tracks may be replaced with rubber-tired wheels.

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EIMCO 105's COST LESS . . . INCREASE PROFITS

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Both 105 Loaders have this same "extra" margin of built-in strength for the **tough** jobs. Both mount on the basic 105 crawler-tractor that gets extra performance from every attachment through high-speed mobility. Each employs an entirely different operating principle for tasks where physical conditions make one or the other more practical.

The 105 Excavator is ideal for highway tunnel work . . . or narrow cuts where overhead discharge eliminates awkward "dump position" maneuvers . . . speeds cycle time and minimizes interference with by-passing motorists.

The 105 Heavy Duty Front-End Loader is ideal where discharging into light units . . . handling fine, dusty or extremely wet material . . . or cutting smooth grades call for close control. Breakout force on this machine is 40,000 pounds.

On any given **TOUGH** job that really tests the ability of equipment to produce, Eimcos will move more yards every day than any other equally-rated machine.

Get all the facts on 105 Eimcos before you buy!

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B-256

Totes and spreads whopping 27 yards— TIMKEN® bearings whip the loads

LE TOURNEAU-WESTINGHOUSE CO. mounts vital moving parts of its Model B Tournapull on Timken bearings to eliminate friction, keep them on the go.

POUNDING shock loads and heavy thrust loads on wheels put wear and tear on this Model B Tournapull as it totes and spreads a whopping 27 yards of material. To help the giant self-propelled scraper keep working steadily and cut maintenance, LeTourneau-Westinghouse engineers specified Timken® tapered roller bearings for the wheels, gear boxes, countershaft and 8 other vital working parts.

Taking heavy shock loads is routine work for Timken bearings. Their rollers and races are case-carburized to have hard, wear-resistant surfaces over tough, shock-resistant cores. Full line contact between rollers and races gives Timken bearings *extra* load-carrying capacity. And Timken bearings' tapered construction lets them take both radial and thrust loads or *any* combination. Shafts are held rigid. Gears mesh accurately, wear less, last longer.

Because scrapers and other road machines work under constant clouds of dust and dirt, closures are especially important. Timken bearings keep shafts concentric with the housings, making closures more effective. Dirt and dust stay *out;* lubricant stays *in.* Maintenance is reduced.

And Timken bearings practically eliminate friction. That's because they are geometrically designed to have true rolling motion—are precision-made to live up to their design. They *roll* the load. Bearing life is lengthened. Parts wear longer, too.

To further insure bearing quality, we even make our own fine alloy steel—America's only bearing manufacturer that does. For your No. 1 bearing value, always look for the trade-mark "Timken". The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ont. Cable address: "TIMROSCO".

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